VOLUME 2

Draft

Environmental Impact Statement

Chuckwalla Solar Projects

BUREAU OF INDIAN AFFAIRS
Bureau of Land Management
Environmental Protection Agency
US Fish and Wildlife Service
Bureau of Reclamation
National Park Service
Nevada Department of Transportation
Nevada Department of Wildlife

On Behalf of:
THE MOAPA BAND OF PAIUTE INDIANS

January 2022

Volume 2

DRAFT
ENVIRONMENTAL IMPACT STATEMENT
(DEIS)

CHUCKWALLA SOLAR SOLAR PROJECTS

On Behalf of:

THE MOAPA BAND
OF PAIUTE INDIANS

BUREAU OF INDIAN AFFAIRS
BUREAU OF LAND MANAGEMENT
ENVIRONMENTAL PROTECTION AGENCY
US FISH AND WILDLIFE SERVICE
BUREAU OF RECLAMATION
NATIONAL PARK SERVICE
NEVADA DEPARTMENT OF WILDLIFE
NEVADA DEPARTMENT OF TRANSPORTATION

January 2022

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Bureau of Indian Affairs
Western Regional Office
2600 North Central Avenue
Phoenix, AZ 85004

August 2021

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APPENDICES

1.0 INTRODUCTION

EDF Renewables Development, Inc. (EDFR or Applicant) has entered into an agreement with the Moapa Band of Paiute Indians (Moapa Band or Band) to develop up to four solar projects collectively referred to as the Projects on the Moapa River Indian Reservation (Reservation) in Clark County, Nevada. The four solar projects would total up to 700 MWs of solar energy generation, each using photovoltaic (PV) technology and incorporating battery energy storage systems (BESS). The proposed Chuckwalla solar generating facilities would be constructed entirely within the Reservation within a lease study area of approximately 6,500 acres of tribal trust land. These lands are in the southeast corner of the Reservation on lands set aside by the Moapa Band for the Projects.

The Bureau of Indian Affairs (BIA), as lead agency, in cooperation with the Moapa Band, the Bureau of Land Management (BLM), Environmental Protection Agency (EPA), the US Fish and Wildlife Service (USFWS), National Park Service (NPS), US Department of Air Force (DAF), Bureau of Reclamation (Reclamation), Nevada Department of Wildlife (NDOW), and Nevada Department of Transportation (NDOT) are preparing an Environmental Impact Statement (EIS) that will evaluate the development of the four solar projects and associated facilities.

The National Environmental Policy Act (NEPA) scoping process is designed to inform and encourage involvement by all interested parties and to help agencies make better-informed decisions. This report summarizes all comments received during the scoping period for the EIS. The BIA and cooperating agencies will fully analyze the issues raised by these scoping comments to help shape the environmental analysis and alternatives to be considered in the Draft EIS.

The purpose of this report is to summarize issues raised by individuals, organizations, and agencies during the scoping comment period for this Project. This report also describes methods used for soliciting input, as well as how comments received were categorized by resource topic. A copy of each individual comment received is contained in **Appendix D** of this report.

PROJECT DESCRIPTION

The proposed Projects are located in the southeast corner of the Reservation on lands set aside by the Moapa Band for the Projects. The solar fields and associated facilities would be in Sections 13, 14, 22, 23, 24, 25, 26, 27, 34, 35, and 36; Township 16 South, Range 65 East; Mount Diablo Base Meridian.

Major components of each solar site would include multiple blocks of solar PV panels mounted on tracking systems, H-beam or pad mounted inverters, transformers, collection lines, BESS, project substations, and O&M facilities. The four separate projects would include: Chuckwalla 1A – a 200 MW project; Chuckwalla 1B - a 50 MW project; Chuckwalla 2 - a 200 MW project; and Chuckwalla 3 - a 250 MW project.

Chuckwalla 1A and 1B would be built at the same time as the first phase. Chuckwalla 2 and Chuckwalla 3 would be built separately in subsequent phases. Construction of each phase is expected to take approximately 18 to 20 months.

Two generation interconnection (gen-tie) lines approximately 10 to 12 miles long would interconnect the Projects to the regional electrical grid – one to the existing Harry Allen substation and one to the existing Crystal Substation. These lines would be built parallel to one another for most of their length; approximately 4.5 miles would be in the designated utility corridor on the Reservation that is managed by BLM and BLM land.

Access to the Chuckwalla sites would be provided via I-15 to the Valley of Fire Highway to an existing 2.5-mile road on the Reservation paralleling its southern border that would be upgraded as needed. Water for each phase will be needed during construction for dust control and a minimal amount will be needed during operations for administrative/sanitary water use and panel washings. The water supply for the Projects would be leased from the Moapa Band and delivered to the site via temporary water pipeline or by truck.

The Applicant is expected to operate each of the energy facilities for up to 35 years under the terms of the solar leases with the Moapa Band. Each project is expected to be built to meet its corresponding PPA for the output of the Projects.

The EIS will focus on the Proposed Action as described above at the location on the Reservation selected by the Moapa Band. It will evaluate the Proposed Action and the No Action Alternative. Additional viable alternatives may be identified in response to issues raised during the scoping process.

2.0 SCOPING PROCESS AND SOLICITATION OF COMMENTS

During the scoping period, the BIA informed the public, landowners, Government agencies, tribes, and interested stakeholders about the proposed Chuckwalla Solar Projects and solicited their comments. The BIA announced the Project and the initiation of the scoping process, held public scoping meetings, and invited the public to comment and ask questions. The public scoping meetings were publicized in the Federal Register, on the Project website, in letters mailed to interested stakeholders, and through public notices/news releases published in local newspapers. These outreach and notification activities are described in more detail in the following subsections.

FEDERAL REGISTER

The public scoping period officially began with the publication of the Notice of Intent (NOI) to prepare an EIS, which described the project, announced the public scoping meetings, and outlined the ways to provide comments. The NOI was published in the Federal Register on April 23, 2021 and a correction to the NOI was published on April 29, 2021 correcting the comment deadline (May 24, 2021). These can be found in **Appendix A**.

PROJECT WEBSITE

A Project website was established for access by anyone at any time during the SEIS process. It provides Project information and an opportunity to submit comments. The website will remain active for the duration of the SEIS process and can be accessed at https://www.ChuckwallaSolarProjectsEIS.com/.

SCOPING NOTIFICATION LETTER

Scoping notification letters were sent by the BIA to Government agencies, elected officials, property owners near the proposed Project, various non-Governmental organizations, and other interested stakeholders. The scoping letter briefly explained the Project, identified the Federal review process, announced the public scoping meetings, and described the various ways to provide comments. Included with the scoping notification letter were two maps displaying the Project location.

Over 50 scoping letters and maps were mailed on April 23, 2021. The scoping letter, maps, and the Project mailing list can be found in **Appendix B**.

NEWSPAPER ADVERTISEMENTS

A legal notice/public notice announcing the public scoping meetings was published in two local newspapers. The publications included:

- Las Vegas Review-Journal - on May 5 and 9, 2021
- Moapa Valley Progress - on May 5 and 12, 2021

Copies of the published legal notices/public notices can be viewed in **Appendix B**.

METHODS FOR SUBMITTING COMMENTS

The BIA encouraged interested parties to submit comments through a variety of methods:

- Individual letters could be hand delivered or mailed via the U.S. Postal Service to Mr. Chip Lewis, Regional Environmental Protection Officer, BIA Western Regional Office, 2600 North Central Avenue, 4th Floor Mailroom, Phoenix, AZ 85004.
- Comments could be submitted on the "Getting involved" tab on the Project website via the "Submit comment here" comment form at www.ChuckwallaSolarProjectsEIS.com.
- Comments could also be provided via email or telephone to Mr. Chip Lewis at chip.lewis@bia.gov; telephone: (602) 379-6750.
- Comments could be provided at the public scoping meetings either orally or by filling out a comment form provided at on the Projects website. A copy of the comment form from the website is provided in **Appendix C**.

See below for the details of the scoping meetings.

3.0 SCOPING MEETINGS

PUBLIC SCOPING MEETINGS

The BIA hosted two virtual public information and scoping meetings. These meetings provided a description of the NEPA process, information on the proposed Project, and the opportunity to provide public comments. The two virtual public scoping meetings were held at the times listed below.

Meeting Date / Time	Attendance
May 18, 2021 1:30PM Pacific	0*
May 19, 2021 5:30PM Pacific	0*
Total Attendance	**0**

**Note: These attendance numbers do not include individuals from BIA, Applicant, and their consultants.*

The virtual meetings could be accessed via a link on the project website (www.ChuckwallaSolarProjectsEIS.com). A PowerPoint presentation was posted to the project website prior to the virtual meetings. Those who were not able to live stream the presentation would be able to access the meeting presentation and join by telephone at (346) 248-7799, Passcode 9041407949#.

No public participants joined either of the two virtual public meetings.

PRESENTATION

At the meetings, a formal presentation was provided . The presentation opened with a welcome and introductions by Mr. Chip Lewis, the Environmental Protection Officer for the BIA, and project manager for the Chuckwalla Projects EIS.

Mr. Lewis provided an overview of the NEPA process followed by Randy Schroeder of ENValue (the EIS consultant) who presented the proposed Project with an overview of the technical aspects of the Chuckwalla Projects and a summary of the environmental issues identified to date. The scoping meeting presentation is provided in **Appendix C**.

The meeting presentation was recorded.

INTERAGENCY SCOPING MEETING

During the afternoon of May 19, an interagency scoping was held virtually to explain the Projects and solicit input. In addition to BIA, the meeting was attended by representatives from USFWS, BLM, EPA, DAF, NPS, Reclamation, NDOW, and NDOT. **Appendix C** contains a copy of the presentation and **Appendix D** contains a summary of the discussion.

4.0 COMMENT EVALUATION

COMMENTS RECEIVED

The scoping period began on April 23, 2021 - the date the NOI was published in the Federal Register. In addition to oral comments received at interagency meeting, there were six comment letters/forms received. All comments were evaluated and copies of them are contained in **Appendix D**.

PROCESSING COMMENTS

Each comment document was read to identify key issues. In some cases, a single comment document contained multiple comments that were identified by resource/issue categories. A matrix summarizing the comments is included in **Appendix D**.

SUMMARIZATION

This report summarizes issue areas identified from the scoping comments received. For the purposes of this summary, all comments were given equal weight, regardless of whether they were mentioned once or mentioned several times. This report does not prioritize issue areas or track the number of comments each issue category received. The identified issues and areas of concern will be used to guide the environmental analysis for the EIS.

5.0 ISSUE SUMMARY

This section provides a summary of the key issues identified by the comments provided during scoping for the Chuckwalla Solar Projects. These issues will be addressed in the EIS analysis.

KEY ISSUES IDENTIFIED DURING SCOPING	
ISSUE TOPIC	**ISSUE/COMMENT**
Water Resources	Need to comply with relevant floodplain and stormwater requirements to minimize erosion and sediment production
	Avoid development within major washes
	Describe the amount and source of the water to be used during construction and operation
Soils	Should include measures to minimize grading and soil disturbance to the extent possible
Vegetation	Should include measures to minimize vegetation clearing to the extent possible
	Should include measures to control weeds to the extent possible
Cultural Resources	Determine whether the development could have potentials effects to significant cultural sites in the lease study area that would need to be mitigated or avoided.
	Determine whether the project could impact the Old Spanish National Historic Trail
Socioeconomics	Describe the economic development opportunity for the Band
	Describe the jobs for tribal members and others in the region that would be created
Land Use / Management	Determine potential impacts to nearby Valley of Fire State Park and Valley of Fire Natural Landmark
	Determine potential impacts to Air Force operations
Wildlife	Describe the potential impacts to threatened and endangered species (including the desert tortoise) and other sensitive wildlife species
	Consider measures that minimize impacts to desert tortoise habitat and connectivity such as fencing to allow tortoises to re-enter and utilize the site following construction
	Describe the potential impacts to avian species from construction and operation of the project
Visual Resources	Evaluate the impact the solar fields could have on views of the landscape
Air Quality/Public Health	Measures should be implemented to control and minimize fugitive dust and to prevent worker exposure to Coccidioides spores, if present
Regional Impacts	Identify impacts from other solar projects and other developments in the area
	Discuss trends of and collective impacts to key resources including desert tortoise

6.0 NEXT STEPS

The BIA will develop the Draft EIS focusing on the identified issues including evaluating a range of reasonable alternatives, assessing potential impacts, and identifying possible mitigation measures. Once complete, the BIA will publicly circulate the Draft EIS for review and comment. During this period, the BIA will notify the public of the Draft EIS availability via a Notice of Availability (NOA) published in the Federal Register and public notices in the local papers. There will also be public meetings where those who are interested may comment on the Draft EIS.

Any public or stakeholder comments received on the Draft EIS will be addressed in the Final EIS. The availability of the Final EIS will also be announced via an NOA published in the Federal Register and public notices in the local papers.

The BIA anticipates providing periodic status updates as needed and publishing all project documents on the project website at www.ChuckwallaSolarProjectsEIS.com.

Appendix A

Notice of Intent

Beginning date	Ending date	Under-payments (percent)	Over-payments (percent)	Corporate overpayments (Eff. 1–1–99) (percent)
070106	123107	8	8	7
010108	033108	7	7	6
040108	063008	6	6	5
070108	093008	5	5	4
100108	123108	6	6	5
010109	033109	5	5	4
040109	123110	4	4	3
010111	033111	3	3	2
040111	093011	4	4	3
100111	033116	3	3	2
040116	033118	4	4	3
040118	123118	5	5	4
010119	063019	6	6	5
070119	063020	5	5	4
070120	063021	3	3	2

Dated: April 19, 2021.

Jeffrey Caine,

Chief Financial Officer, U.S. Customs and Border Protection.

[FR Doc. 2021–08465 Filed 4–22–21; 8:45 am]

BILLING CODE 9111–14–P

DEPARTMENT OF THE INTERIOR

Bureau of Indian Affairs

[212A2100DD/AAKC001030/A0A501010.999900253G]

Notice of Intent To Prepare an Environmental Impact Statement for the Chuckwalla Solar Projects on the Moapa River Indian Reservation, Clark County, Nevada

AGENCY: Bureau of Indian Affairs, Interior.

ACTION: Notice of intent to prepare an environmental impact statement.

SUMMARY: The Bureau of Indian Affairs (BIA), as lead agency in cooperation with the Moapa Band of Paiute Indians (Moapa Band), Bureau of Land Management (BLM), and other agencies, intend to prepare an Environmental Impact Statement (EIS) that will evaluate the development of the Chuckwalla Solar Projects (Projects) on Moapa River Indian Reservation (Reservation) tribal lands. This notice announces the beginning of the scoping process to solicit public comments and identify potential issues related to the EIS. The BIA requests comments concerning the scope of the analysis, and identification of relevant information, studies, and analyses. It also announces that two public scoping meetings will be held virtually or in person to identify potential issues, alternatives, and mitigation to be considered in the EIS.

DATES: All comments must be received by May 3, 2021. The draft environmental impact statement is scheduled for October 2021 and the final environmental impact statement is scheduled for January 2022 with a Record of Decision in March 2022.

ADDRESSES: Send written comments to Mr. Chip Lewis, BIA Western Regional Office, 2600 North Central Avenue, 4th Floor Mailroom, Phoenix, Arizona 85004. Comments may also be sent via email to *Chip.Lewis@bia.gov* or on the Projects website at *www.ChuckwallaSolarProjectsEIS.com.*

FOR FURTHER INFORMATION CONTACT: Chip Lewis, BIA; telephone: (602) 379–6750; email: *Chip.Lewis@bia.gov.* Individuals who use telecommunication devices for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339 between 8 a.m. and 8 p.m., Eastern Time, Monday through Friday.

SUPPLEMENTARY INFORMATION:

Purpose and Need of the Proposed Action

The proposed Federal action, taken under 25 U.S.C. 415, is BIA's approval of the solar energy ground lease and related agreements entered into by the Moapa Band with EDF Renewables Development, Inc. (EDFR or Applicant). The agreements provide for construction, operation and maintenance (O&M), and decommissioning of up to 700 megawatts (MWs) from up to four solar photovoltaic (PV) electricity generation facilities located entirely on the Reservation and specifically on lands held in trust by the United States for the Moapa Band.

In addition, two transmission generation interconnection (gen-tie) lines would be constructed to interconnect the Projects to the regional electrical grid. Portions of these lines would cross lands managed by BLM within a designated utility corridor on the Reservation and BLM land. The BIA and BLM would approve rights-of-way (ROWs) authorizing the construction and operation of the transmission lines.

The purposes of the proposed Projects are, among other things, to: (1) Help to provide a long-term, diverse, and viable economic revenue base and job opportunities for the Moapa Band; (2) meet the terms of the existing Power Purchase Agreements (PPAs) for the output of the Projects; (3) help Nevada and neighboring states to meet their State renewable energy needs; and (4) allow the Moapa Band, in partnership with the Applicant, to optimize the use of the lease site while maximizing the potential economic benefit to the Tribe.

Preliminary Proposed Action and Alternatives

The Applicant plans to develop up to four solar projects collectively referred to as the Projects on the Reservation in Clark County, Nevada. The four solar projects would total up to 700 MWs of solar energy generation, each using photovoltaic (PV) technology and incorporating battery energy storage systems (BESS).

The proposed Chuckwalla solar generating facilities would be constructed entirely within the Reservation within a lease study area of approximately 6,400 acres of tribal trust land. These lands are in the southeast corner of the Reservation on lands set aside by the Moapa Band for the Projects. The solar fields and associated facilities would be in Sections 13, 14, 22, 23, 24, 25, 26, 27, 34, 35, and 36; Township 16 South, Range 65 East; Mount Diablo Base Meridian.

Major components of each solar site would include multiple blocks of solar

PV panels mounted on tracking systems, H-beam or pad mounted inverters, transformers, collection lines, BESS, Projects substation, and O&M facilities. The four separate projects would include: Chuckwalla 1A—a 200 MW project; Chuckwalla 1B—a 50 MW project; Chuckwalla 2—a 200 MW project; and Chuckwalla 3—a 250 MW project.

Chuckwalla 1A and 1B would be built at the same time as the first phase. Chuckwalla 2 and Chuckwalla 3 would be built separately in subsequent phases. Construction of each phase is expected to take approximately 18 to 20 months.

Two gen-tie lines approximately 10 to 12 miles long would interconnect the Projects to the regional electrical grid—one to the existing Harry Allen substation and one to the existing Crystal Substation. These lines would be built parallel to one another for most of their length; approximately 4.5 miles would be in the designated utility corridor on the Reservation that is managed by BLM and BLM land.

Access to the Chuckwalla sites would be provided via I–15 to the Valley of Fire Highway to an existing 2.5-mile road on the Reservation paralleling its southern border that would be upgraded as needed. Water for each phase will be needed during construction for dust control and a minimal amount will be needed during operations for administrative/sanitary water use and panel washings. The water supply for the Projects would be leased from the Moapa Band and delivered to the site via temporary water pipeline or by truck.

The Applicant is expected to operate each of the energy facilities for up to 35 years under the terms of the solar leases with the Moapa Band. Each project is expected to be built to meet its corresponding PPA for the output of the Projects.

The EIS will focus on the Proposed Action as described above at the location on the Reservation selected by the Moapa Band. It will evaluate the Proposed Action and the No Action Alternative. Additional viable alternatives may be identified in response to issues raised during the scoping process.

Summary of Expected Impacts

Potential impacts to be addressed in the EIS analysis may include, but would not be limited to, impacts on water resources, biological resources, threatened and endangered species, cultural resources, Native American religious concerns, aesthetics, and traffic. In addition to those resource topics identified above, Federal, State, and local agencies, along with other stakeholders that may be interested or affected by the BIA's decision on the proposed Projects, are invited to participate in the scoping process to identify additional issues to be addressed.

Anticipated Permits and Authorizations

In addition to the land lease and ROWs to be approved by BIA and the ROWs to be approved by BLM, the Projects would also require other permits and authorizations. These could include a Utility Environmental Protection Act (UEPA) permit from the Public Utilities Commission of Nevada and/or dust control and special use permits from Clark County.

Schedule for the Decision-Making Process

The EIS will provide a framework for BIA and BLM to make determinations and to decide whether to take the aforementioned Federal actions. The Records of Decision (RODs) to be issued by the BIA and BLM are currently scheduled for March 2022.

Public Scoping Process

This notice of intent initiates the scoping process, which guides the development of the EIS. Two public scoping meetings will be conducted either virtually or in person to further describe the Projects and identify potential issues and alternatives to be considered in the EIS. If in person, one public scoping meeting will be held on the Reservation and the other public scoping meeting will be held in Las Vegas, Nevada. If held virtually, the public meetings can be joined online through the Projects website at *www.ChuckwallaSolarProjectsEIS.com.* Those unable to live stream the presentation would be able to access the meeting presentation on the project website and could join by telephone. Additionally, the live presentation will be recorded and made accessible for viewing throughout the scoping period. During either the in-person or virtual meetings, a short presentation will be made and team members will be present to discuss and answer questions. The PowerPoint presentation will be posted to the Projects website and printed copies will be made available at the BLM Las Vegas Field Office and the Moapa River Indian Reservation Tribal Hall prior to the meetings. The dates of the public scoping meetings will be included in notices to be posted in the *Las Vegas Sun, Las Vegas Review-Journal,* and *Moapa Valley Progress* 15 days before the meetings.

Please include your name, return address, and the caption ''EIS, Chuckwalla Solar Projects,'' on the first page of any written comments. You may also submit comments at the public scoping meetings.

Request for Identification of Potential Alternatives, Information, and Analyses Relevant to the Proposed Action

Interested parties are invited to identify potential alternatives, issues to be analyzed, mitigation measures, and other information to be considered in the EIS.

Lead and Cooperating Agencies

BIA will prepare the EIS in cooperation with the Moapa Band, BLM, Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (USFWS), and possibly the National Park Service (NPS) and Nevada Department of Wildlife (NDOW). The resulting EIS will aim to: (1) Provide agency decision makers, the Moapa Band, and the general public with a comprehensive understanding of the impacts of the proposed development of the solar field on the Reservation; (2) describe the cumulative impacts of increased development on the Reservation; and (3) identify and propose mitigation measures that would minimize or prevent significant adverse impacts.

Decision Maker

This notice is published in accordance with 40 CFR 1501.9 of the Council of Environmental Quality regulations and 43 CFR 46.235 of the Department of the Interior Regulations implementing the procedural requirements of the NEPA (42 U.S.C. 4321 *et seq.*), and in accordance with the exercise of authority delegated to the Principal Deputy Assistant Secretary—Indian Affairs by part 209 of the Department Manual.

Nature of Decision To Be Made

The BIA and the BLM decisions, if approved, would assist in addressing the management objectives in the Energy Policy Act of 2005 (Title II, Section 211) and Secretarial Order 3285A1 (March 11, 2009) that established the development of environmentally responsible renewable energy as a priority for the Department of the Interior.

Because the BIA has a jurisdictional trust responsibility over Indian lands and the BLM has land management responsibilities under FLPMA, the Projects is a major Federal action and must comply with the National

Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*). Because most of the Projects would be located on tribal trust lands, the BIA is the lead federal agency. The Moapa Band, BLM, EPA, NPS, NDOW, and USFWS may be cooperating agencies on the EIS for the Projects. The BIA and BLM will use this EIS to make their respective decisions and the other cooperating parties will use this information to support their analyses and decisions, as needed. It is important that reviewers provide their comments at such times and in such manner that they are useful to the agency's preparation of the environmental impact statement. Therefore, comments should be provided prior to the close of the comment period and should clearly articulate the reviewer's concerns and contentions.

Comments received in response to this solicitation, including names and addresses of those who comment, will be part of the public record for this proposed action. Comments submitted anonymously will be accepted and considered, however.

Bryan Newland,

Principal Deputy Assistant Secretary—Indian Affairs.

[FR Doc. 2021–08469 Filed 4–22–21; 8:45 am]

BILLING CODE 4337–15–P

DEPARTMENT OF THE INTERIOR

Office of the Secretary

[18XD4523WT DWT000000.000000 DS64950000 DP.64920; OMB Control Number 1090–0008]

Agency Information Collection Activities; E-Government Website Customer Satisfaction Surveys

AGENCY: Office of Strategic Employee and Organization Development, Federal Consulting Group, Office of the Secretary, Interior.

ACTION: Notice of information collection; request for comment.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995, the Federal Consulting Group is proposing to renew an information collection.

DATES: Interested persons are invited to submit comments on or before June 22, 2021.

ADDRESSES: Send your written comments to Federal Consulting Group (FCG), Attention: Lucy Adams, 1849 C St. NW, MS 4344, Washington, DC 20240–0001, or via email to Luciana_*adams@ios.doi.gov*. Individuals providing comments should reference Customer Satisfaction Surveys (OMB ID: 1090–0008).

FOR FURTHER INFORMATION CONTACT: To request additional information or copies of the form(s) and instructions, please write to the Federal Consulting Group, Attention: Lucy Adams, 1849 C St. NW, MS 4344, Washington, DC 20240–0001, by telephone at 202–513–7679, or via email to *Luciana_adams@ios.doi.gov.*

SUPPLEMENTARY INFORMATION: In accordance with the PRA and 5 CFR 1320.8(d)(1), all information collections require approval under the PRA. We may not conduct, or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

As part of our continuing effort to reduce paperwork and respondent burdens, we invite the public and other Federal agencies to comment on new, proposed, revised, and continuing collections of information. This helps us assess the impact of our information collection requirements and minimize the public's reporting burden. It also helps the public understand our information collection requirements and provide the requested data in the desired format.

We are especially interested in public comment addressing the following:

(1) Whether or not the collection of information is necessary for the proper performance of the functions of the agency, including whether or not the information will have practical utility;

(2) The accuracy of our estimate of the burden for this collection of information, including the validity of the methodology and assumptions used;

(3) Ways to enhance the quality, utility, and clarity of the information to be collected; and

(4) How might the agency minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, *e.g.,* permitting electronic submission of response.

Comments that you submit in response to this notice are a matter of public record. We will include or summarize each comment in our request to OMB to approve this ICR. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Abstract: The Office of Management and Budget regulation at 5 CFR 1320, which implements the provisions of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*), require that interested members of the public and affected agencies have an opportunity to comment on information collection and recordkeeping activities [see 5 CFR 1320.8(d)].

This information collection activity provides a means to consistently assess, benchmark, and improve customer satisfaction with Federal government agency websites within the Executive Branch. The Federal Consulting Group of the Department of the Interior serves as the executive agent for this methodology and has partnered with ForeSee to offer this assessment to federal agencies.

ForeSee is a leader in customer satisfaction and customer experience management on the web and related media. Its methodology (Customer Experience Analytics or CXA) is a derivative of one of the most respected, credible, and well known measures of customer satisfaction in the country, The ForeSee CXA methodology combines survey data and a patented econometric model to precisely measure the customer satisfaction of website users, identify specific areas for improvement, and determine the impact of those improvements on customer satisfaction and future customer behaviors.

The ultimate purpose of ForeSee CXA is to help improve the quality of goods and services available to American citizens, including those from the Federal government.

The E-Government website Customer Satisfaction Surveys will be completed subject to the Privacy Act of 1974, Public Law 93–579, December 31, 1974 (5 U.S.C. 522a). The agency information collection will be used solely for the purpose of the survey. The contractor will not be authorized to release any agency information upon completion of the survey without first obtaining permission from the Federal Consulting Group and the participating agency. In no case shall any new system of records containing privacy information be developed by the Federal Consulting Group, participating agencies, or the contractor collecting the data. In addition, participating Federal agencies may only provide information used to randomly selected respondents from among established systems of records provided for such routine uses.

provide date for the annual program budget justification. The aggregated report is not considered confidential. The form must be completed by Federally recognized Tribes that operate child protection programs. Submission of this information by Federally recognized Tribes allows the BIA to consolidate and review selected data on Indian child welfare cases. The data is useful on a local level, to the Tribes and Tribal entities that collect it, for case management purposes. The data are useful on a nationwide basis for planning and budget purposes.

Title of Collection: Indian Child Welfare Quarterly and Annual Report.

OMB Control Number: 1076–0131.

Form Number: None.

Type of Review: Revision of a currently approved collection.

Respondents/Affected Public: Federally recognized Tribes or Tribal entities that are operating programs for Tribes.

Total Estimated Number of Annual Respondents: 565 per year, on average.

Total Estimated Number of Annual Responses: 2,260 per year, on average.

Estimated Completion Time per Response: Approximately 30 minutes for Part A—ICWA Data; approximately 30 minutes for Part B—Tribal Child Abuse and Neglect Data.

Total Estimated Number of Annual Burden Hours: 1,130 per year on average.

Respondent's Obligation: A response is required to obtain a benefit.

Frequency of Collection: Four times per year for the Part A—ICWA Data; if applicable, four times per year for Part B—Tribal Child Abuse Neglect Data.

Total Estimated Annual Nonhour Burden Cost: $0.

An agency may not conduct or sponsor and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number.

The authority for this action is the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq*).

Elizabeth K. Appel,

Director, Office of Regulatory Affairs and Collaborative Action—Indian Affairs.

[FR Doc. 2021–08946 Filed 4–28–21; 8:45 am]

BILLING CODE 4337–15–P

DEPARTMENT OF THE INTERIOR

Bureau of Indian Affairs

[212A2100DD/AAKC001030/A0A501010.999900253G]

Notice of Intent To Prepare an Environmental Impact Statement for the Chuckwalla Solar Projects on the Moapa River Indian Reservation, Clark County, Nevada; Correction

AGENCY: Bureau of Indian Affairs, Interior.

ACTION: Notice of intent to prepare an environmental impact statement; correction.

SUMMARY: On April 23, 2021, the Bureau of Indian Affairs (BIA) published in the **Federal Register** a notice announcing that it intends to prepare an Environmental Impact Statement (EIS) that will evaluate the development of the Chuckwalla Solar Projects on Moapa River Indian Reservation tribal lands. The document contained an incorrect comment deadline.

DATES: All comments on the Chuckwalla Solar Projects EIS must be received by May 24, 2021.

ADDRESSES: Send written comments to Mr. Chip Lewis, BIA Western Regional Office, 2600 North Central Avenue, 4th Floor Mailroom, Phoenix, Arizona 85004. Comments may also be sent via email to *Chip.Lewis@bia.gov* or on the Projects website at *www.ChuckwallaSolarProjectsEIS.com.*

FOR FURTHER INFORMATION CONTACT: Chip Lewis, BIA; telephone: (602) 379–6750; email: *Chip.Lewis@bia.gov.* Individuals who use telecommunication devices for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339 between 8 a.m. and 8 p.m., Eastern Time, Monday through Friday.

SUPPLEMENTARY INFORMATION:

Correction

In the **Federal Register** of April 23, 2021, in FR Doc. 2021–08469, on page 21760, in the second column, correct the comment deadline in the **DATES** section of the notice to read ''May 24, 2021.''

Bryan Newland,

Principal Deputy Assistant Secretary—Indian Affairs.

[FR Doc. 2021–08952 Filed 4–28–21; 8:45 am]

BILLING CODE 4337–15–P

DEPARTMENT OF THE INTERIOR

Bureau of Indian Affairs

[212A2100DD/AAKC001030/A0A501010.999900253G]

Indian Gaming; Extension of Tribal-State Class III Gaming Compact (Rosebud Sioux Tribe and the State of South Dakota)

AGENCY: Bureau of Indian Affairs, Interior.

ACTION: Notice.

SUMMARY: This notice announces the extension of the Class III gaming compact between the Rosebud Sioux Tribe of the Rosebud Indian Reservation and the State of South Dakota.

DATES: The extension takes effect on April 29, 2021.

FOR FURTHER INFORMATION CONTACT: Ms. Paula L. Hart, Director, Office of Indian Gaming, Office of the Assistant Secretary—Indian Affairs, Washington, DC 20240, (202) 219–4066.

SUPPLEMENTARY INFORMATION: An extension to an existing Tribal-State Class III gaming compact does not require approval by the Secretary if the extension does not modify any other terms of the compact. 25 CFR 293.5. The Rosebud Sioux Tribe of the Rosebud Indian Reservation and the State of South Dakota have reached an agreement to extend the expiration date of their existing Tribal-State Class III gaming compact to October 24, 2021. This publication provides notice of the new expiration date of the compact.

Bryan Newland,

Principal Deputy Assistant Secretary—Indian Affairs.

[FR Doc. 2021–08950 Filed 4–28–21; 8:45 am]

BILLING CODE 4337–15–P

DEPARTMENT OF THE INTERIOR

Office of the Secretary

[18XD4523WT DWT000000.000000 DS64950000 DP.64920; OMB Control Number OMB Control Number 1090–0007]

Agency Information Collection Activities; American Customer Satisfaction Index (ACSI) Government Customer Satisfaction Surveys

AGENCY: Office of Strategic Employee and Organization Development, Federal Consulting Group, Office of the Secretary, Interior.

ACTION: Notice of information collection; request for comment.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995, the

Appendix B

Scoping Notifications and Mailing List

Appendix B – Scoping Notifications and Mailing List

In addition to the NOI, the public was formed about the scoping period and public meetings by one or more of the following notifications:

- Public notification via U.S. Mail:
    - Mailing list
    - Scoping letter
    - Project overview maps
- Newspaper advertisements
    - Las Vegas Review Journal
    - Moapa Valley Progress

Scoping Letter

United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
Western Region
2600 N. Central Avenue, Fourth Floor Mailroom
Phoenix, AZ 85004-3050

DEPARTMENT OF THE INTERIOR
Bureau of Indian Affairs

Notice of Intent to Prepare an Environmental Impact Statement (EIS) for the proposed Chuckwalla Solar Projects on the Moapa River Indian Reservation, Clark County, Nevada

AGENCY: Bureau of Indian Affairs, Interior

ACTION: Notice

SUMMARY: The Bureau of Indian Affairs (BIA), as lead agency, in cooperation with the Moapa Band of Paiute Indians (Moapa Band), Bureau of Land Management (BLM), and other agencies, intend to prepare an Environmental Impact Statement (EIS) that will evaluate the development of the Chuckwalla Solar Projects on the Moapa River Indian Reservation.

This notice announces the beginning of the scoping process to solicit public comments and identify potential issues related to the EIS. It also announces that two public scoping meetings will be held virtually to identify potential issues, alternatives, and mitigation to be considered in the EIS.

DATES: Written comments on the scope of the EIS or implementation of the proposal must arrive by May 24, 2021. The public scoping meetings will be held on May 18 at 1:30 PM Pacific and on May 19, 2021 at 5:30 PM Pacific.

The virtual meetings can be accessed via a link on the project website (*www.ChuckwallaSolarProjectsEIS.com)*. A PowerPoint presentation will be posted to the project website prior to the virtual meetings. Those who cannot live stream the presentation would be able to access the meeting presentation and can join by telephone at (346) 248-7799, Passcode 9041407949#. Each meeting will begin at the scheduled start time with a brief presentation beginning shortly after introductions followed by an open forum to ask questions or make statements. The meeting will continue until all questions have been answered. Additionally, the live presentation will be recorded and made accessible for viewing throughout the scoping period.

ADDRESSES: You may mail, email, or hand carry written comments to Mr. Chip Lewis, BIA Western Regional Office, 2600 North Central Avenue, 4th Floor Mailroom, Phoenix, Arizona 85004; telephone: (602) 379–6750; email: *Chip.Lewis@bia.gov*. You can also provide comments via the project website at *www.ChuckwallaSolarProjectsEIS.com*.

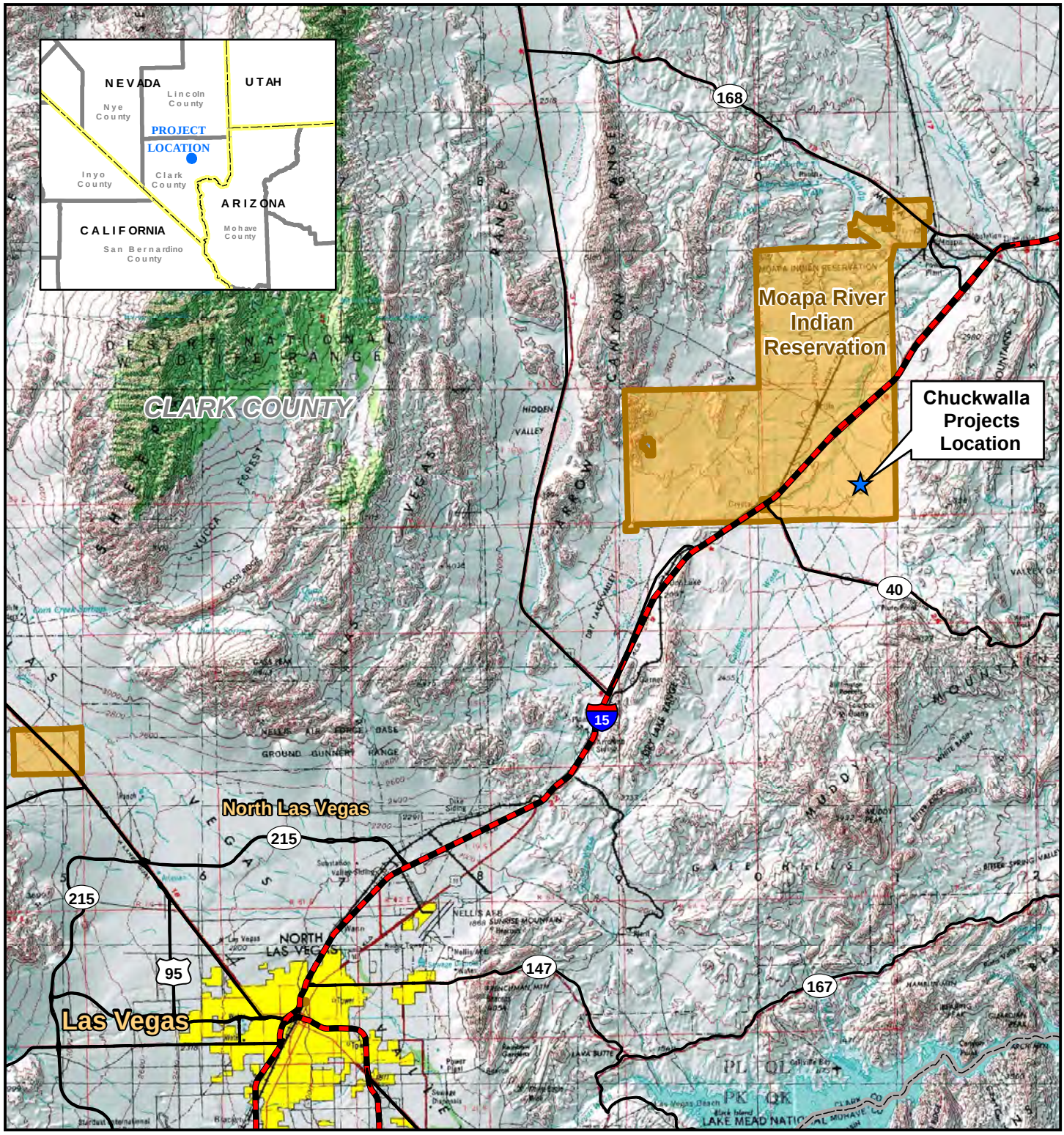
SUPPLEMENTARY INFORMATION: The proposed Federal action, taken under 25 U.S.C. 415, is BIA's approval of the solar energy ground lease and related agreements entered into by the Moapa Band with EDF Renewables Development, Inc. (EDFR or Applicant). The agreements provide for construction, operation and maintenance (O&M), and decommissioning of up to 700 megawatts (MWs) from up to four solar photovoltaic (PV) electricity generation facilities located entirely on the Reservation and specifically on lands held in trust by BIA for the Moapa Band. In addition, two transmission generation interconnection (gen-tie) lines would be constructed to interconnect the Projects to the regional electrical grid. Portions of these lines would cross lands managed by BLM within a designated utility corridor on the Reservation and BLM land. The BIA and BLM would approve rights-of-way (ROWs) authorizing the construction and operation of the transmission lines.

The Applicant plans to develop up to four solar projects totaling up to 700 MWs of solar energy generation with each using photovoltaic (PV) technology and incorporating battery energy storage systems (BESS). The proposed Chuckwalla solar generating facilities would be constructed on the Reservation within a lease study area of approximately 6,400 acres of tribal trust land. These lands are in the southeast corner of the Reservation on lands set aside by the Moapa Band for the Projects.

AUTHORITY: This notice is published in accordance with 40 CFR 1501.7 of the Council of Environmental Quality regulations and 43 CFR 46.235 of the Department of the Interior Regulations implementing the procedural requirements of the NEPA (42 U.S.C. 4321 et seq.), and in accordance with the exercise of authority delegated to the Principal Deputy Assistant Secretary-Indian Affairs by part 209 of the Department Manual.

Date: 4/23/21

Mr. Bryan Bowker
Director, Western Region
Bureau of Indian Affairs



Legend

- Solar Project Location
- Interstate
- US/ State Highway
- Railroad

Jurisdictional Land Ownership

- Indian Reservation

0 2 4 6 8 10

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

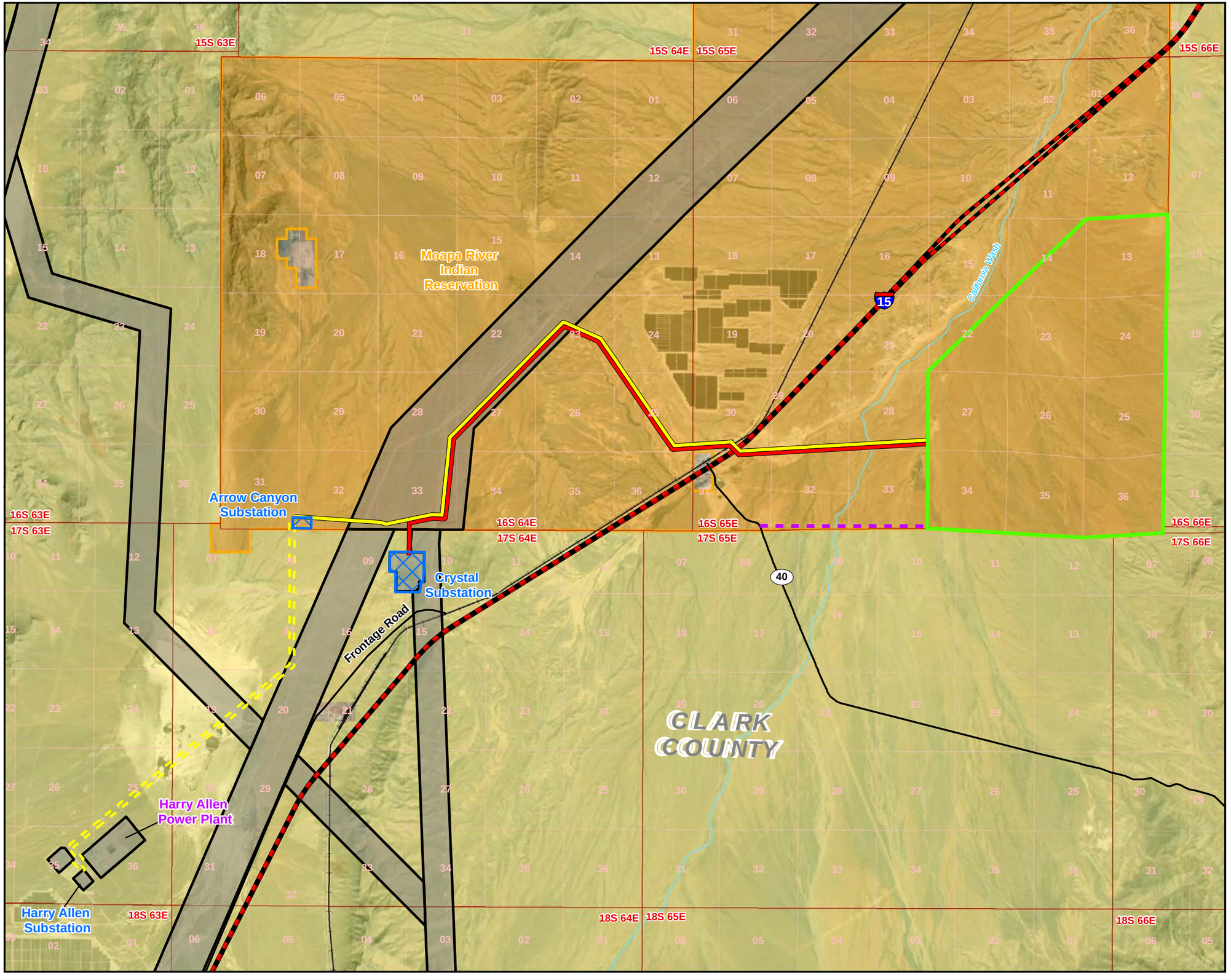
Chuckwalla Solar Projects

FIGURE 1-1
General Location

Map Extent: Clark County, Nevada

Date: 11-03-20		Author: rnc

G:\Chuckwalla Solar Project/MXD's/Project Location 8.5x11 110320.mxd



Legend

Project Components

- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Approved ROW Arrow Canyon - Harry Allen

General Features

- Interstate
- Major Highway
- Railroad
- Stream / River
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 0.5 1 1.5

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

Figure 1-2
Project Overview Map

Map Extent: Clark County, Nevada

Date: 02-09-21		Author: rnc

G:\MXD's\Project Location_020921.mxd

Mailing List

Last	Title	Organization/Affiliation	Address 1	Address 2	City	State	Zip
		Center for Biological Diversity	PO Box 710		Tucson	AZ	85702-0710
		Center for Energy Efficiency and Renewable Technologies	1100 11th Street, Suite 311		Sacramento	CA	95814
	Community Development	City of Mesquite	10 E. Mesquite Blvd.		Mesquite	NV	89027
		Clark County Department of Comprehensive Planning	Clark County Government Center	500 South Grand Central Parkway	Las Vegas	NV	89155
		Clark County Regional Flood Control District	600 South Grand Central Parkway	Suite 300	Las Vegas	NV	89106-4511
		Conservation District of Southern Nevada	5820 South Pecos Road A-400		Las Vegas	NV	89120
		Department of Air Quality and Environmental Management	Clark County Desert Conservation Program	500 South Grand Central Parkway	Las Vegas	NV	89155-5201
		Desert Tortoise Council	4654 East Avenue S	#257B	Palmdale	CA	93552
		Environmental Defense Fund	1107 9th Street	Suite 1070	Sacramento	CA	95814
Shoemaker		Federal Aviation Administration	Air Traffic Airspace Branch, ASW-520	2601 Meacham Blvd.	Fort Worth	TX	76137-0520
	President	Friends of Gold Butte	12 W. Mesquite Blvd.	Suite 106	Mesquite	NV	89027
		Friends of Nevada Wilderness	PO Box 33155		Las Vegas	NV	89133
		FTV Comm C/O Level 3	1025 Eldorado Way		Broomfield	CO	80023
		Great Basin Resource Watch	P.O. Box 207		Reno	NV	89504
		Great Basin Transmission, Care of LS Power	5000 Hopyard Road	Suite 480	Pleasanton	CA	94588
		Holly Energy Partners	P.O. Box 1260		Artesia	NM	88211
		Intermountain Power Project	P.O. Box 111		Los Angeles	CA	90051
		Kern River Gas Transmission Company	2755 East Cottonwood Parkway	Suite 300	Salt Lake City	UT	84121
	Real Estate Group	KRoad Moapa Solar, LLC	c/o First Solar Electric, LLC	135 Main St. 6th Floor	San Francisco	CA	94105
		Lahontan Audubon Society	Board of Trustees	P.O. Box 2304	Reno	NV	89505
Holloway	Manager	Los Angeles Department of Water and Power	Environmental Planning and Assessment	111 N. Hope Street, Room 1044	Los Angeles	CA	90012
		Natural Resource Conservation Service	5820 South Pecos Road	Building A, Suite 400	Las Vegas	NV	89120
		Natural Resources Defense Council	1314 Second Street		Santa Monica	CA	90401
		Nellis Air Force Base	6020 Beale Ave	Suite 135	Nellis AFB	NV	89191
		Nevada Clean Energy Campaign	755 N Roop St #202		Carson City	NV	89701
		Nevada Conservation League	2275 Renaissance Drive	Suite A	Las Vegas	NV	89128
		Nevada Department of Air Quality and Environmental Management	Clark County Government Center	500 South Grand Central Parkway	Las Vegas	NV	89156
		Nevada Department of Conservation and Natural Resources	901 S. Stewart St., suite 1003		Carson City	NV	89701
		Nevada Department of Transportation	1263 South Stewart Street		Carson City	NV	89712
Hardenbrook	Supervisory Habitat Biologist	Nevada Department of Wildlife	Southern Region	3373 Pepper Lane	Las Vegas	NV	89120
		Nevada Division of Environmental Protection	901 South Stewart Street, Suite 4001		Carson City	NV	89701-5249
		NV Energy	Environmental Department	PO Box 98910	Las Vegas	NV	89151-0001
		NV Energy	Corporate Headquarters	6226 West Sahara Avenue	Las Vegas	NV	89146
		Nevada Environmental Coalition, Inc	10720 Button Willow Drive		Las Vegas	NV	89134
		Nevada Natural Resource Education Council	901 S Stewart St		Carson City	NV	89702-4741
		Nevada State Historic Preservation Office	901 South Stewart	Suite 5004	Carson City	NV	89701
		Nevada Wilderness Project	Southern Nevada Office	PO Box 33155	Las Vegas	NV	89133
		Nevada Wildlife Federation	PO Box 71238		Reno	NV	89570
	Conservation Committee	Red Rock Audubon Society	PO Box 96691		Las Vegas	NV	89193
Bakrania, EIT	Senior Engineer	Geosyntec Consultants, Inc.	9480 South Eastern Ave, Suite 217		Las Vegas	NV	89123
		Sierra Club	3828 Meadows Lane		Las Vegas	NV	89107
		Sierra Nevada Alliance	PO Box 7989		South Lake Tahoe	CA	96158
		Sierra Pacific Power Company	P.O. Box 10100		Reno	NV	89520
		Southern Nevada Water Authority	1001 S. Valley View Blvd		Las Vegas	NV	89153
		The Conservation Alliance	PO Box 1275		Bend	OR	97709
		The Nature Conservancy	8329 West Sunset Road	Suite 200	Las Vegas	NV	89113
		Union Pacific Railroad Company	1400 Douglas Street		Omaha	NE	68179
		US Army Corps of Engineers	St. George Regulatory Office	321 N Mall Drive, Suite L-101	St. George	UT	84790
		Western Resource Advocates	204 North Minnesota Street	Suite A	Carson City	NV	89703
		Friends of Nevada Wilderness	8180 Placid St.		Las Vegas	NV	89123
Shaw	Nevada Director	Old Spanish Trail Association	P.O.Box 68		Blue Diamond	NV	89004
Brittner	Executive Director	Old Spanish Trail Association	Email: ostamgr@gmail.com				
Felmlee	President	Old Spanish Trail Association	178 Glory View Drive		Grand Junction	CO	81503
Emmerich		Basin and Range Watch	P.O Box 70		Beatty	NV	89002

Newspaper Notices

AFFIDAVIT OF PUBLICATION

STATE OF NEVADA)
COUNTY OF CLARK) SS:

ENVALUE LLC
2514 TOURNAMENT DR
CASTLE ROCK CO 80108

Account # 179051

Ad Number 0001145741

Eileen Gallagher, being 1st duly sworn, deposes and says: That she is the Legal Clerk for the Las Vegas Review-Journal and the Las Vegas Sun, daily newspapers regularly issued, published and circulated in the City of Las Vegas, County of Clark, State of Nevada, and that the advertisement, a true copy attached for, was continuously published in said Las Vegas Review-Journal and / or Las Vegas Sun in 2 edition(s) of said newspaper issued from 05/02/2021 to 05/09/2021, on the following days:

05 / 02 / 21
05 / 09 / 21

/S/ Eileen Gallagher
LEGAL ADVERTISEMENT REPRESENTATIVE

Subscribed and sworn to before me on this 10th day of May, 2021

Notary Mary Lee

MARY A. LEE
Notary Public, State of Nevada
Appointment No. 21-7624-01
My Appt. Expires Dec 15, 2024

Public Meeting Announcement

The U.S. Bureau of Indian Affairs (BIA) and the Moapa Band of Paiute Indians invite you to attend a scoping meeting to help identify the range and scope of issues related to the proposed Chuckwalla Solar Projects. The issues identified during the scoping process will be considered and addressed during preparation of an Environmental Impact Statement (EIS).

Please plan to attend one of the following virtual meetings:

Tuesday, May 18, 2021 at 1:30 PM Pacific

Wednesday, May 19, 2021 at 5:30 PM Pacific

The virtual meetings can be accessed via a link on the project website (www.ChuckwallaSolarProjectsEIS.com). A PowerPoint presentation will be posted to the project website prior to the virtual meetings. Those who cannot live stream the presentation would be able to access the meeting presentation and can join by telephone at (346) 248-7799, Passcode 9041407949#. Each meeting will begin at the scheduled start time with a brief presentation beginning shortly after introductions followed by an open forum to ask questions or make statements. The meeting will continue until all questions have been answered. Additionally, the live presentation will be recorded and made accessible for viewing throughout the scoping period.

EDF Renewables Development, Inc. (EDFR or Applicant) plans to develop up to four solar projects totaling up to 700 MWs of solar energy generation with each using photovoltaic (PV) technology and incorporating battery energy storage systems (BESS). The Projects would be located entirely on the Moapa River Indian Reservation in Clark County, approximately 30 miles northeast of Las Vegas. The Projects would include two transmission generation interconnection (gen-tie) lines and portions of these lines would cross lands managed by Bureau of Land Management (BLM) within a designated utility corridor on the Reservation and BLM-managed federal land. The BIA and BLM would approve rights-of-way (ROWs) authorizing the construction and operation of the transmission lines.

For more information on how to participate, contact Mr. Chip Lewis, Regional Environmental Protection Officer, at Chip.Lewis@bia.gov (602.379.6750) or Mr. Randy Schroeder at rschroeder@envalue.us.

PUB: May 2, 9, 2021
LV Review-Journal

The PROGRESS
An independent, locally-owned newspaper serving the communities of northeast Clark County

LAURA ROBISON
PO BOX 430
Overton, NV 89040
Office: (702) 397-6246
Fax: (702) 397-6247
progress2@mvdsl.com

AFFIDAVIT OF PUBLICATION

State of Nevada, Clark County

I, Laura R. Robison, Office Manager of The Progress, a weekly newspaper published in Moapa Valley, Clark County, Nevada, being duly sworn hereby certify that the following advertisement appeared in The Progress:

public meeting announcement
Bureau of Indian Affairs

A copy of the above described advertising is hereon attached.
It was published in The Progress on this date(s):

5-5-21 and 5-12-21

Signed before a Notary Public:

Signature: Laura R Robison Date: 5-13-21

State of Nevada, County of Clark
This instrument was acknowledged before me Alisha A. Cooper (notary public)
On 13 May 2021 (date) by Laura R. Robison (person signing document)

Alisha A. Cooper
Notary Public Signature

ALISHA A. COOPER
NOTARY PUBLIC
STATE OF NEVADA
My Commission Expires: 07-10-23
Certificate No: 03-83419-1

VVHS Track

from page 1B

18.0 seconds. She took second in high jump with a height of 4-6.00 feet and then won third place in long jump with a distance of 13-3.00 feet.

Pushing herself hard, Jenna Walters took third place and broke a personal record in the 800m with a time of 2:48.3.

Calla Haviland also achieved a personal record (PR) in one of her events. She won third place in the 400m with a PR time of 1:06.2. Haviland also took first place in high jump with a height of 4-8.00.

With less than a week of practice, and her first time competing, Marianna Ruiz-Arriaga took third in Shotput throwing event at 18-8.00.

Abby Felix took a first in discus throwing at 65-01.

The Bulldog boys team also performed well at the meet. Jimmy Kelly got a PR in three of his events taking first place in four events at the meet. He took first place in the 200m with a time of 23.5, another first place in high jump with a height of 5-8.00, first place in long jump with a distance of 17-10.50, and finished with a first place in triple jump with a distance of 39-08.00

Sione Tupou also had a good meet by getting personal bests in both his throwing events. He took second in shotput throwing 36-00.50 and third in discus throwing 87-00.

Ryan Bruehl, one of the seniors on the team, took third in shotput throwing 35-02.50 and second in discus throwing 90-02.

Coming off an injury, Camron Noel took first in the 300m hurdles with a time of 45.7 seconds.

In his first meet back, Riley Averett was able to win the pole vault, clearing 10-00.00.

Grad Plans

from page 3B

with the COVID situation," said Hughes. "We feel it best that we all celebrate together, making it through the challenges of last year and this year. The green and white and the blue and gold will be unified in celebration."

For more information or to make donations, contact VVHS: Tina Jensen at VVHS, Bank of Nevada at 11 W. Pioneer, or Venmo: Darlene Nelson MCEF.

Public Meeting Announcement

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For more information on how to participate, contact *Mr. Chip Lewis, Regional Environmental Protection Officer, at Chip.Lewis@bia.gov (602.379.6750) or Mr. Randy Schroeder at rschroeder@envalue.us.*

Classifieds

Call Classifieds 702-397-6246 or email progress2@mvdsl.com

DEADLINE for classified ads is 11 a.m. MONDAY

Progress Hours: Mon 9am-3pm Tu-Fri 10am-3pm

Employment / Help Wanted

Western Elite is seeking a Blade Hand:

Contact Information:
Kyle Taylor Email: kylet@westernelite.com

More Information:
Blade Hand:
Western elite is seeking a Blade Hand, preferably one who can read plans. Must be willing to run loader, scrapers and other heavy equipment as needed.

The position is located 50 miles north of Las Vegas near Coyote Springs and offers competitive pay, paid time-off, paid holidays, and an excellent benefits package.

Contact Kyle Taylor at kylet@western elite.com

COYOTE SPRINGS GOLF CLUB

Coyote Springs Golf Club is hiring!

***Entry Level Greenskeeper**
$14.25/hour. FULL TIME.

***Housekeeper**
$12.00/hour DOE

***Assistant Mechanic**
Salary DOE

PLEASE APPLY IN PERSON.
Mon-Fri. Ask for Curt or Karl

Applicants MUST be able to pass a drug screening and possess a valid Nevada Driver's License.

3100 State Route 168, Coyote Springs, NV 89037
www.coyotesprings.com<http://www.coyotesprings.com

Moapa Indian Housing Authority currently has a job opening for 1 full time Maintenance Worker. Must posses a valid drivers license and pass a drug test and background check. Job description and Applications are available at the Moapa Indian Housing Authority office 702-865-2730. Due to covid we can email or mail application and job description to you, office address is 26 Pepo Dr., Moapa, NV 89025. Monday through Thursday, 6 a.m. to 4:30 p.m. Applications will NOT be accepted after May 24, 2021 at 4:30 p.m. Indian Preference Per Section 703(i) of Title VII of the Civil Rights Act of 1964, as amended.

Housekeeping Part-Time: Please apply in person at North Shore Inn, 520 N. Moapa Valley Blvd., Overton. Mon-Fri 9am-9pm.

Legacy Rock is now accepting job applications: Experienced only CDL Cement truck driver: Phone 702-398-7625, fax 702-398-7635 or email whip@comnett.net.

AQUATIC (formerly Lasco Bathware) in Moapa, is now hiring: We are accepting applications from 8AM to 3PM Monday through Thursday. Aquatic has a competitive wage starting at $13.00/hr and benefit package, including medical, dental, vision insurance and 401k. We also offer ten paid holidays per year. (702) 864-2100 ext. 4182.

For Rent/Apts

1 & 2 Bedroom Apartments: Behind Post Office in Overton. Clean, Nice. 1 Bedroom, 2 Bedroom, Rent per mo. plus deposits. Quiet lifestyle. No pets or smoking. Call 702-373-6102.

READ OUR CLASSIFIED ADS AT WWW.MVPROGRESS.COM

Western Elite is seeking an Entry-Level Landfill Laborer:

Contact Information:
Kyle Taylor Email: kylet@westernelite.com

More Information:
Landfill Laborer:
Western Elite is seeking an entry-level Landfill Laborer. Job duties include, but are not limited to: manual labor (including organizing, cleaning, and shoveling waste materials), picking up trash, pulling weeds, trimming and irrigating trees

The position is located 50 miles north of Las Vegas near Coyote Springs and offers competitive pay, paid time-off, paid holidays, and an excellent benefits package

Contact Kyle Taylor at kylet@western elite.com

Miscellaneous

New Whirlpool washer/dryer combo. Cost $1200, sell for $500. 702-817-6091.

New indoor / outdoor E-wheels power chair: Rotating seat. $1900. Call 702-370-8416.

Real Estate

Do you need to sell your home, trailer or land fast and without doing repairs? Local real estate investor will give you a cash offer within 24 hours. (702) 777 3303.

Services

Certified Horticulturist: I will provide successful plant suggestions, plant identification, landscape concepts, and answer plant and landscape questions. Problems with your plants? Call Andrea Meckley @702.300.4148 "Let's Talk Plants"

READY MIX CONCRETE: Call 702-398-3444 office or 702-281-4181 cell.
Legacy Rock 4/28

Dog Training: Whether you have a young pup, older dog or a rescue, K9Heroes dog training classes can help them learn how to behave appropriately at home and on the go. K9Heroes trainers teach fun & effective group or private classes. Call for availability & times, 702-308-0609. If you're not 100% satisfied, you can retake the class for FREE! Veterans & disabled 50% discount!

Services

Slabs, sidewalks, foundations, house slabs, block walls, pools. We can pour anything you want. Call Office 702-398-7625 or cell 702-281-4181

MOBILE IMAGE WINDOW TINTING: Autos/homes/etc. 15+ years of exp., 100% guaranteed. Call for a quote & to make an appt. 702-596-6760.

For Clean Quality Concrete work call 702-397-6540. 30+ years experience, 19 years local. References.

Logandale Storage and U-Haul: 2 locations! Storage Units, U-Haul trucks and trailers, Car Haulers, Dolly's. Let us help make your move easier!
Call 702-398-3390. 1595 Jensen and 3525 N. Moapa Valley Blvd. Logandale

Yard Sales

Garage Sale this Friday/Saturday, May 7/8, 7am-12noon. Sewing, crafts, quiltings, seasonal, knick/knacks, bedding, clothes, tools, kitchen.
740 W. Liston, Logandale.

NEED TO BUY, SELL, TRADE?
PUT YOUR AD HERE:
CALL TODAY!
702-397-6246
The PROGRESS

Jam

from page 1A

about the racing experience, along with fellow competitor Robert Wingert who had just got nudged back to finish 2nd behind Kobylarz.

"The weather was just perfect for the races and almost all weekend, except for the wind on Friday," Wingert said.

Throughout all the fun, there were local vendors and food trucks gathered at the station to provide shopping experiences for unique items to festival-goers

"There were massive crowds, tons during the weekend; especially on Saturday," stated local resident Val Simondi. "It has been a most needed and amazing event."

Simondi was enjoying Sunday afternoon at the Jam, with her husband Al, and friends Dawn Hocks, Wendy Lyons, and Denise Hollinder. They were seated in the shade just outside of the bar, listening to one of their favorite bands for the weekend, Vinyl Fusion.

"This was needed since there wasn't (a Beaver Dam Jam event) last year and they have done some great things here at the bar," Simondi said.

Simondi was referring to the recently renovated Beaver Dam Bar. The room is now more open with a bigger and themed performance stage. The place holds triple the number of people that it once did.

"They really opened things up and it looks great," stated Tammy Houchen, lead singer of Vinyl Fusion which is based out of St. George, Utah. "I am very pleased to be back up and running! We love this bar and it is one of our favorite places."

Vinyl Fusion, along with Reciprocity, were the crowd favorites for the weekend. Vinyl Fusion includes Houchen, Tom Fault, Brad Dalorf, and Dave Spencer with Vietnam Veteran Mark Allred. Allred has played at the Beaver Dam Bar consistently for 27 years and 4th Festival performance as part of Vinyl Fusion. The band brought in over 100 people (about 60 within the bar) to the festival on Sunday alone.

The vendors and food trucks were a first at the festival this year. "It is so good they added them this year," said Houchens.

The vendor "Cabin Classics" reported a healthy profit from sales during the weekend as they provided homemade soaps, healing lotion sticks, tye-dye clothing, apparel, and more.

Also, the Desert Rose Church had a vendors station with donated yard sale items and gemstones to provide funding for the church.

The Red Wagon Food Truck was present with the best Beaver Burger. People were satisfied and enthusiasm filled the air as the normalcy of living life returned to the small rural area.

"We can't wait for next year's Jam," said Houchens at the end of the celebration.

Public Meeting Announcement

The U.S. Bureau of Indian Affairs (BIA) and the Moapa Band of Paiute Indians invite you to attend a scoping meeting to help identify the range and scope of issues related to the proposed Chuckwalla Solar Projects. The issues identified during the scoping process will be considered and addressed during preparation of an Environmental Impact Statement (EIS).

Please plan to attend one of the following virtual meetings:

Tuesday, May 18, 2021 at 1:30 PM Pacific

Wednesday, May 19, 2021 at 5:30 PM Pacific

The virtual meetings can be accessed via a link on the project website (www.ChuckwallaSolarProjectsEIS.com). A PowerPoint presentation will be posted to the project website prior to the virtual meetings. Those who cannot live stream the presentation would be able to access the meeting presentation and can join by telephone at (346) 248-7799, Passcode 9041407949#. Each meeting will begin at the scheduled start time with a brief presentation beginning shortly after introductions followed by an open forum to ask questions or make statements. The meeting will continue until all questions have been answered. Additionally, the live presentation will be recorded and made accessible for viewing throughout the scoping period.

EDF Renewables Development, Inc. (EDFR or Applicant) plans to develop up to four solar projects totaling up to 700 MWs of solar energy generation with each using photovoltaic (PV) technology and incorporating battery energy storage systems (BESS). The Projects would be located entirely on the Moapa River Indian Reservation in Clark County, approximately 30 miles northeast of Las Vegas. The Projects would include two transmission generation interconnection (gen-tie) lines and portions of these lines would cross lands managed by Bureau of Land Management (BLM) within a designated utility corridor on the Reservation and BLM-managed federal land. The BIA and BLM would approve rights-of-way (ROWs) authorizing the construction and operation of the transmission lines.

For more information on how to participate, contact *Mr. Chip Lewis, Regional Environmental Protection Officer, at Chip.Lewis@bia.gov (602.379.6750) or Mr. Randy Schroeder at rschroeder@envalue.us.*

McClure

from page 1A

focused."

Cayson was thrilled when he was finally allowed to go back to school.

"We were good at school," he said. "We are doing a lot of good stuff, and I appreciate the students and all they do for me and how hard they work. I love school. It's an honor to be there with everyone."

Never one to want to sit on the sidelines, Cayson has been active with the Student Council, MVHS choir, and broadcasting.

"I like Student Council, and I like choir," he said. "I'm a pretty good singer, and I'm pretty good at broadcasting too."

Once Cayson graduates, he will return to MVHS in the fall as a super senior.

"I plan to return to Moapa Valley High School until I am twenty-two," he explained. "I will be a super senior. Maybe I will get a job at McDonald's or Lins'. We're trying to figure that out."

Cayson's mom Tamerin has been an integral part of helping him through school.

"I love my mom," he said. "She dances with me, and she helps me with getting ready for school and Prom. She is just always with me."

Cayson hopes his advice for the younger students will help them on their journey.

"It's gonna be okay," he said. "Just try to get there. I know you will be able to love the people at Moapa Valley High School. That's my good advice for people and for the kids."

Cayson is the son of Nathan and Tamerin McClure.

Castillo

from page 1A

"I joined the Interact Club and went into Mesquite helped with parades, events, and other things," she explained.

English and Reading are two of Chantal's favorite subjects.

"I just recently got into books and stuff because of my teacher, Ms. Snyder," Chantal explained. "I don't really have any favorites so far. I just like to read."

When asked what the most significant difference was between the first two years of high school and the last two, Chantal didn't even have to stop and think.

"It was the mindset," she said. "I didn't care about school the first two years, and my grades weren't good. These last two years, I've been surrounded by people who push me to do better. My grades are good, and I'm doing well academically and mentally."

Her advice for younger students is simple. "You've got to do it for yourself, and then you will find good friends," Chantal said. "You just gotta do it yourself, and then people that actually care will come in and help you."

After graduation, Chantal plans to attend cosmetology school at the Paul Mitchell School in St. George.

Chantal is number three in a family of five children.

"I have an older brother and then a sister," she said. "Then there's me, another brother, and a baby sister."

Chantal is the daughter of Maria Castillo and Jesus Castro.

PUBLIC NOTICE

IN THE MATTER OF:
LILHA METZLI ANGELES ZAVALA;

CONTINUED INITIAL SEVERANCE HEARING

NOTICE IS HEREBY GIVEN THAT PETITIONER

Jocelyn Zavala has filed a Petition of Parent-Child Relationship with the Juvenile Court in Maricopa County regarding the above named child(ren).

AN INITIAL HEARING HAS BEEN SET TO CONSIDER THE PETITION:

DATE: 5/14/2021
TIME: 8:30am
JUDGE: Commissioner Morton

IT IS ORDERED that the parties appear telephonically using CourtConnect by dialing 1-917-781-4590 and entering access code 599383892# when instructed to do so, or you may join the hearing from your computer, tablet, or smartphone using https://tinyurl.comJUC05Court-Connect

Appendix C

Meeting Materials

Public Meeting Presentation

Chuckwalla Solar Projects

Environmental Impact Statement (EIS)

SCOPING MEETINGS

MAY 18 AND 19, 2021

The NEPA Process

- Chip Lewis
  - Regional Environmental Protection Officer
  - Bureau of Indian Affairs (BIA) (Western Region)

- Contact Information:

BIA
Western Region
Branch of Environmental Quality Services (EQS)
2600 North Central Avenue
4th Floor Mailroom
Phoenix, AZ 85004
(602) 379-6750
chip.lewis@bia.gov

Proposed Action

- **Who has proposed:** EDF Renewables Development, Inc. and Moapa Band of Paiute Indians

- **What is proposed:** Development of up to four PV solar projects totaling 700 MWs on up to 6,500 acres on the Moapa River Indian Reservation (Reservation) with ROWs for transmission gen-ties, access road, and potential temporary water pipeline on both tribal and BLM-managed lands.

- **Where:** Clark County, NV 30 miles northeast of Las Vegas

- **Why:** Provide economic development and other benefits such as jobs and a revenue source for the Moapa Band of Paiute Indians and help meet goals for renewable energy.

Environmental Impact Statement

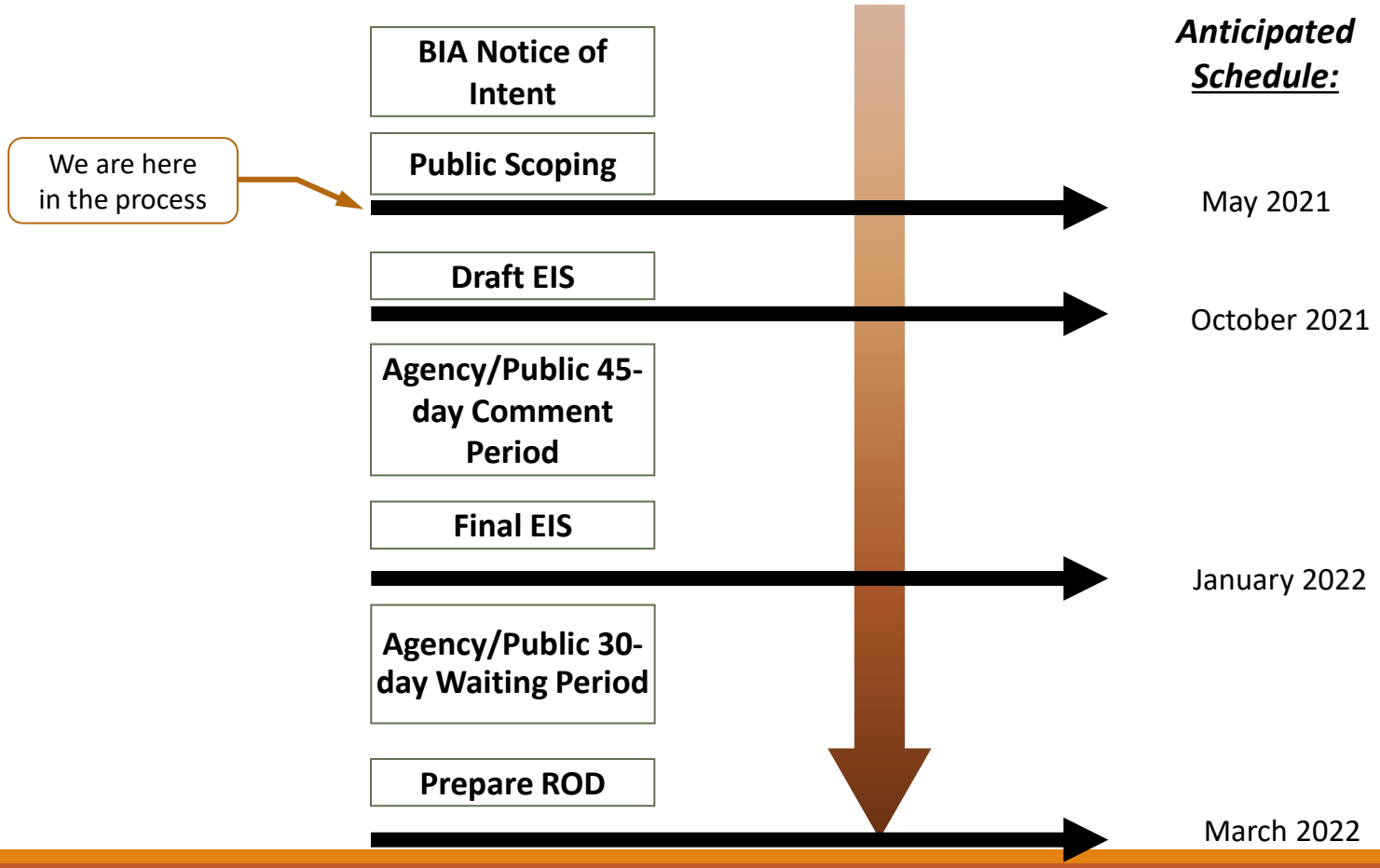
EIS Process

Public input and documentation of environmental impacts that would result from implementation of the Proposed Action to meet the requirements of the National Environmental Policy Act (NEPA) – published in Code of Federal Regulations (CFR 1500-1508). In addition, this analysis could be used to satisfy the requirements of other relevant environmental and cultural resource laws and requirements.

Involved Agencies

- **Lead Federal Agency**
  - U.S. Department of the Interior, Bureau of Indian Affairs
- **Cooperating Agencies**
  - Moapa Band of Paiute Indians (Moapa Band)
  - Bureau of Land Management (BLM)
  - Bureau of Reclamation (Reclamation)
  - Environmental Protection Agency (EPA)
  - US Air Force (USAF)
  - US Fish and Wildlife Service (USFWS)
  - National Park Service (NPS)
  - Nevada Department of Wildlife (NDOW)
  - Nevada Department of Transportation (NDOT)

EIS Process/Schedule



How to Participate

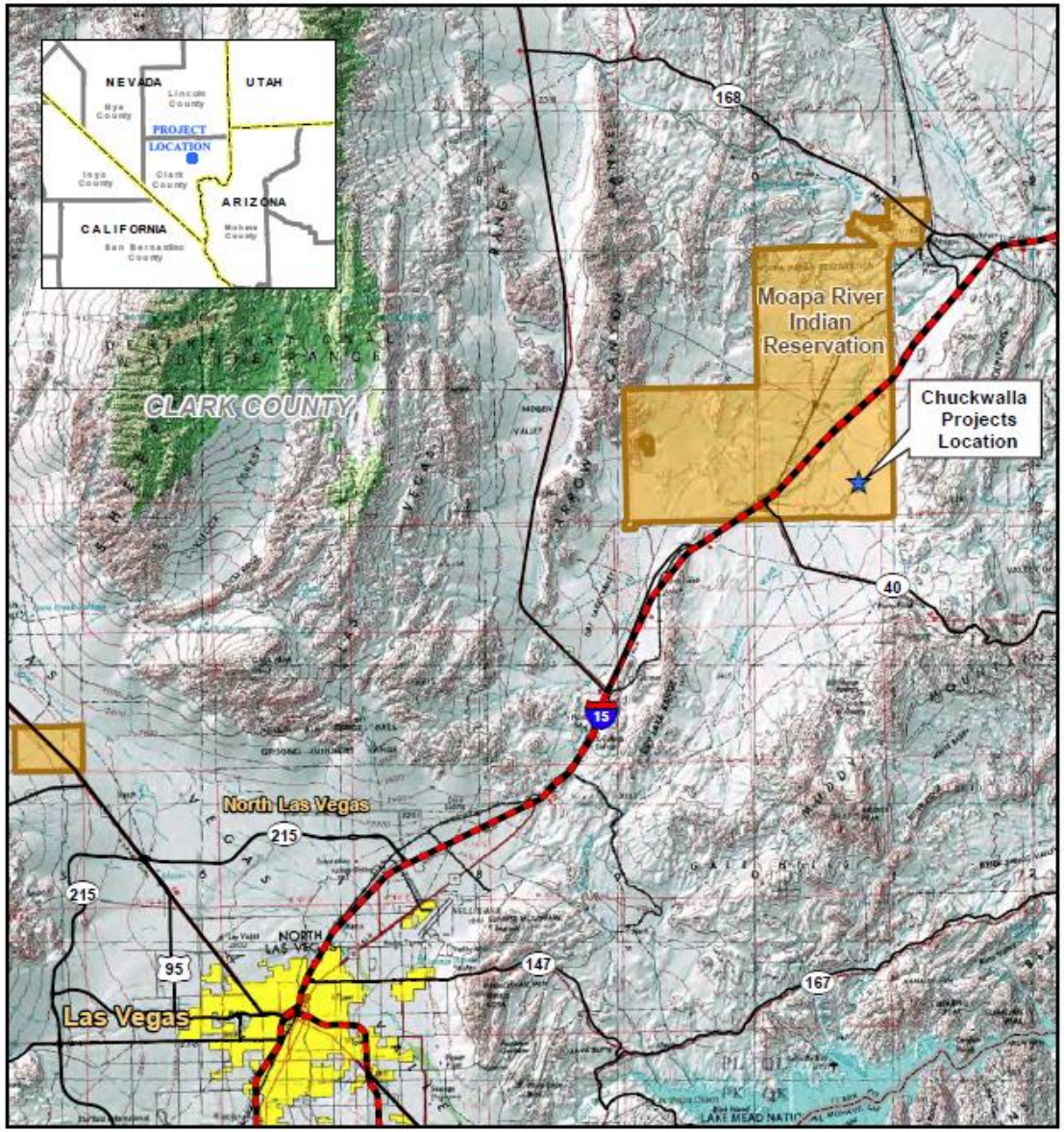
- Submit comment verbally at the end of the presentation
- Submit comment via mail:

  Chip Lewis
  BIA
  Western Region
  Branch of Environmental Quality Services (EQS)
  2600 North Central Avenue
  4th Floor Mailroom
  Phoenix, AZ 85004

- Submit comment via email to:
  - chip.lewis@bia.gov
- Submit comment via the Project Website at:
  - www.ChuckwallaSolarProjectsEIS.com

Project Description

Chuckwalla Solar Projects



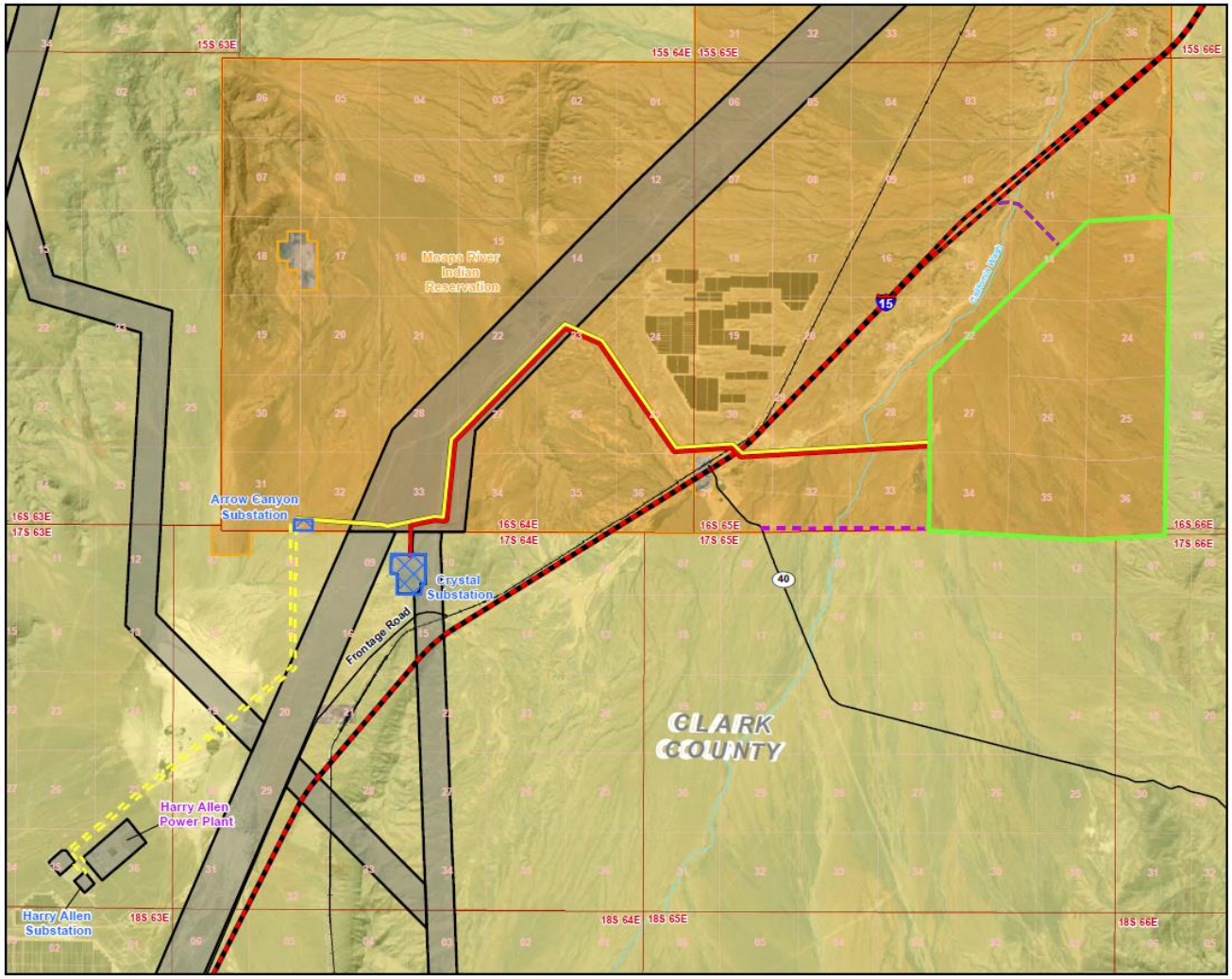
Project Location

Clark County, Nevada

Approximately 30 miles northeast of Las Vegas

Chuckwalla Solar Projects Description

- Four solar projects totaling 700 MWs within a 6,500-acre lease area on Reservation
- Battery Energy Storage System (BESS)
- Gen-tie lines to interconnect at Crystal and Harry Allen Substations
  - ROWs from BIA and BLM
- Improvement to existing road on Reservation for access
- Water provided by Moapa Band
  - Piped or trucked from off-site well or on-site well



Legend

Project Components

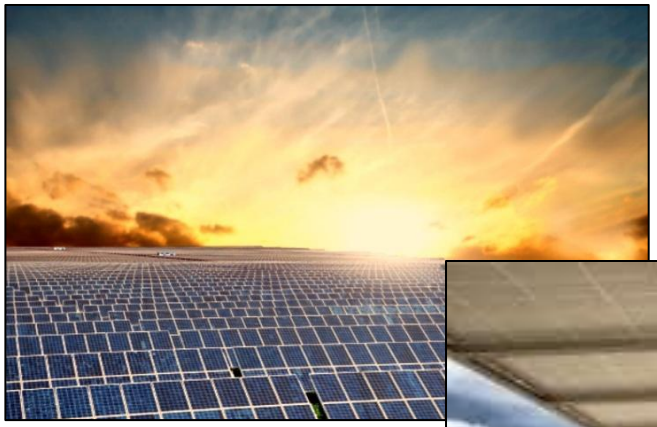
- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Approved ROW Arrow Canyon - Harry Allen

SOLAR FIELD
Township, Range, Section
T16S, R65E
Sections 13, 14, 22, 23, 24, 25, 26, 27, 34, 35, and 36

PV Solar Field

- Solar arrays
- Inverters (converts DC to AC current)
- Battery Energy Storage System (BESS)
- Electrical collection system
- Operation & Maintenance Building on site
- Fencing around the solar arrays

PV Solar Field Components



Chuckwalla Solar Projects
Off-Site ROWs

- Rights-of-Way (ROWs) for transmission gen-tie line, access road, and water pipeline
  - Gen-tie lines to Crystal and Harry Allen Substations
  - Improvement to existing access road on Reservation
  - Potential temporary water pipeline

Potentially Impacted Resources

- Biological Resources
  - Desert Tortoise
  - Desert Vegetation
  - Avian Species
- Cultural Resources
- Visual Resources
- Water Resources
- Socioeconomics

Comments / Questions

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- Contact Information:

  Chip Lewis
  BIA, Western Region
  Branch of Environmental Quality Services
  2600 North Central Avenue
  4th Floor Mailroom
  Phoenix, AZ 85004
  (602) 379-6750
  chip.lewis@bia.gov

- Project Website:

  www.ChuckwallaSolarProjectsEIS.com

Interagency Meeting Presentation

Chuckwalla Solar Projects

Environmental Impact Statement (EIS)

INTERAGENCY SCOPING MEETING

MAY 19, 2021

Proposed Action

- **Who has proposed:** EDF Renewables Development, Inc. and Moapa Band of Paiute Indians

- **What is proposed:** Development of up to four PV solar projects totaling 700 MWs on up to 6,500 acres on the Moapa River Indian Reservation (Reservation) with ROWs for transmission gen-ties, access road, and potential temporary water pipeline on both tribal and BLM-managed lands.

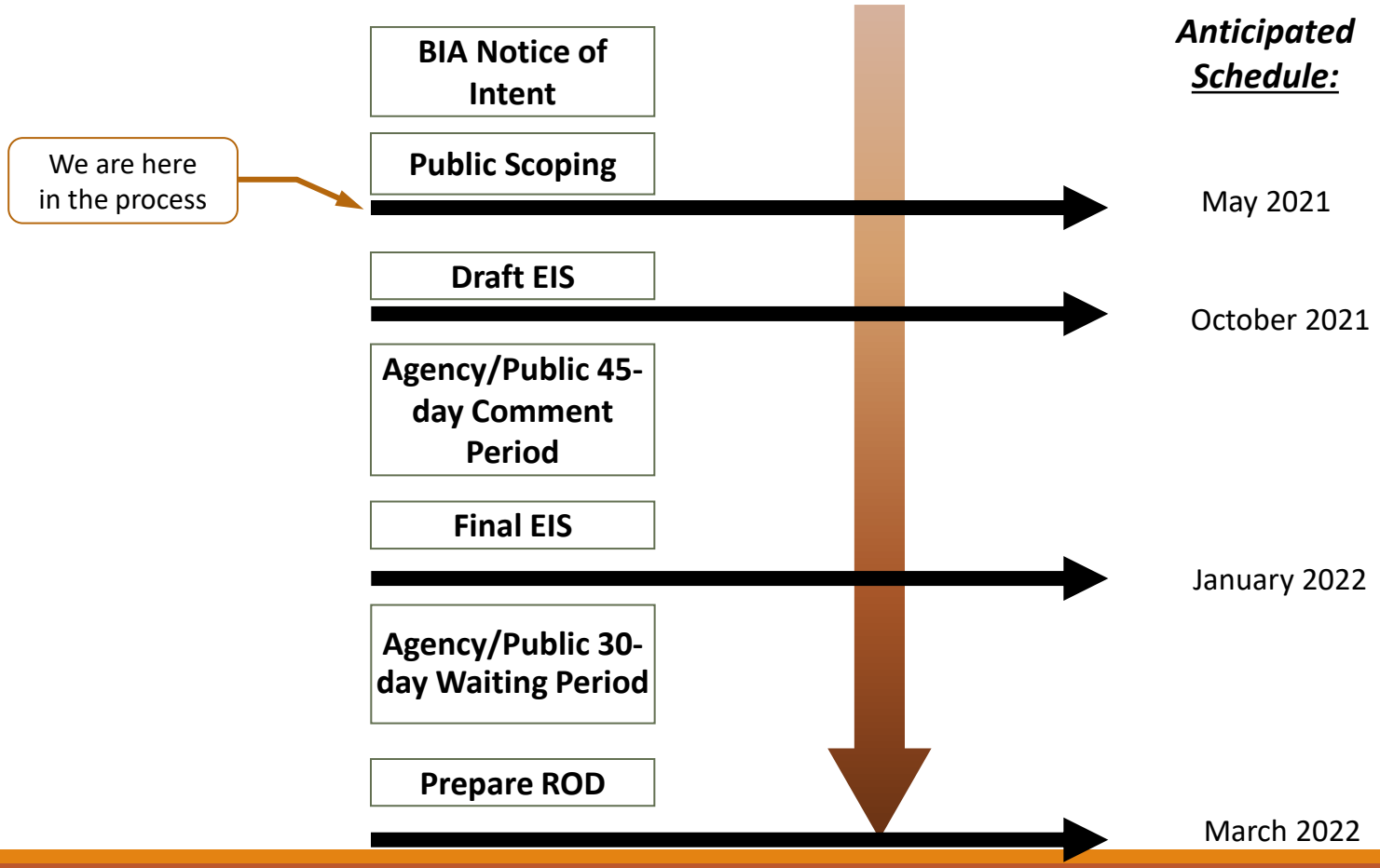
- **Where:** Clark County, NV 30 miles northeast of Las Vegas

- **Why:** Provide economic development and other benefits such as jobs and a revenue source for the Moapa Band of Paiute Indians and help meet goals for renewable energy.

Involved Agencies

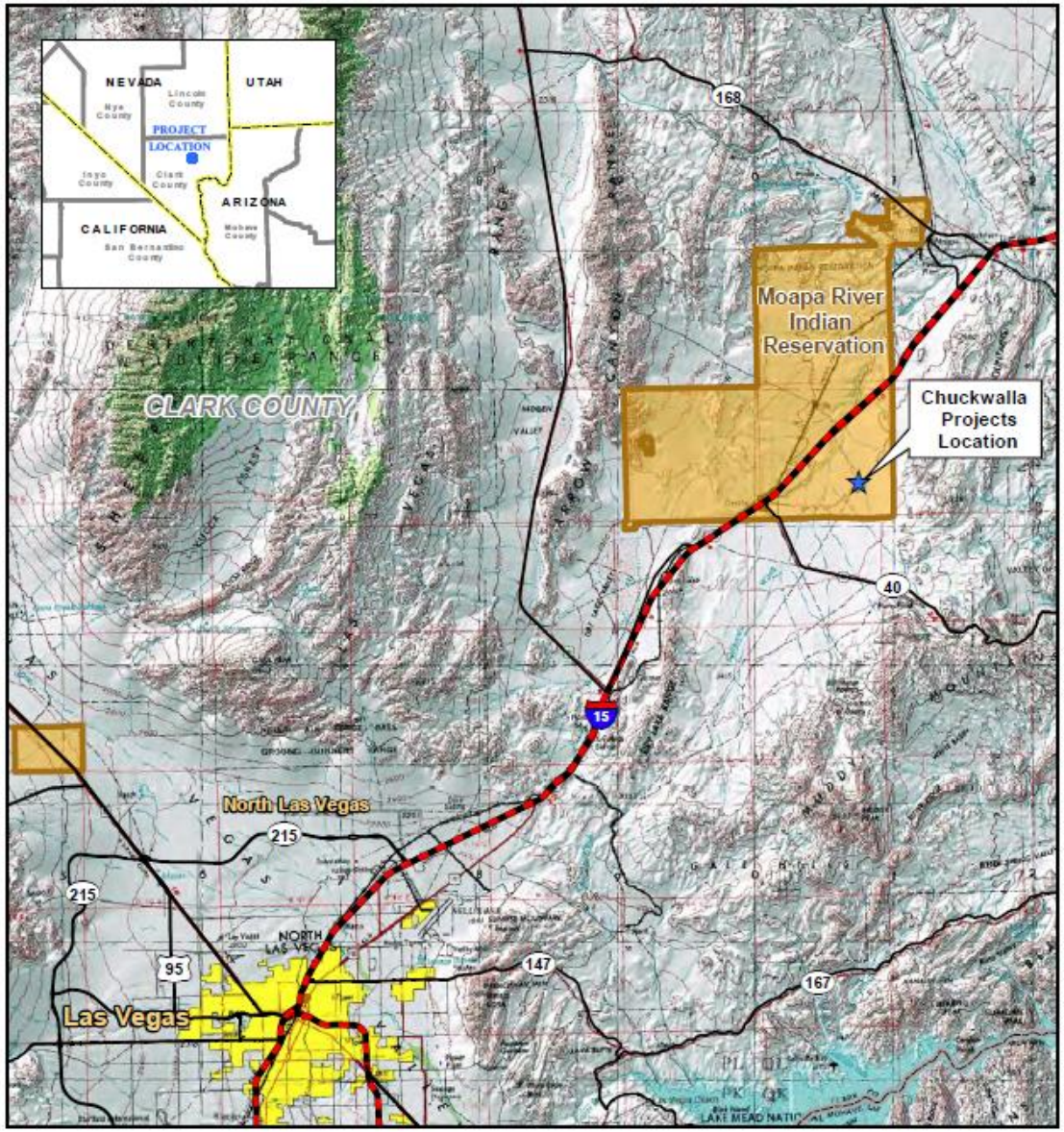
- **Lead Federal Agency**
  - U.S. Department of the Interior, Bureau of Indian Affairs
- **Cooperating Agencies**
  - Moapa Band of Paiute Indians (Moapa Band)
  - Bureau of Land Management (BLM)
  - Bureau of Reclamation (Reclamation)
  - Environmental Protection Agency (EPA)
  - US Air Force (USAF)
  - US Fish and Wildlife Service (USFWS)
  - National Park Service (NPS)
  - Nevada Department of Wildlife (NDOW)
  - Nevada Department of Transportation (NDOT)

EIS Process/Schedule



Project Description

Chuckwalla Solar Projects



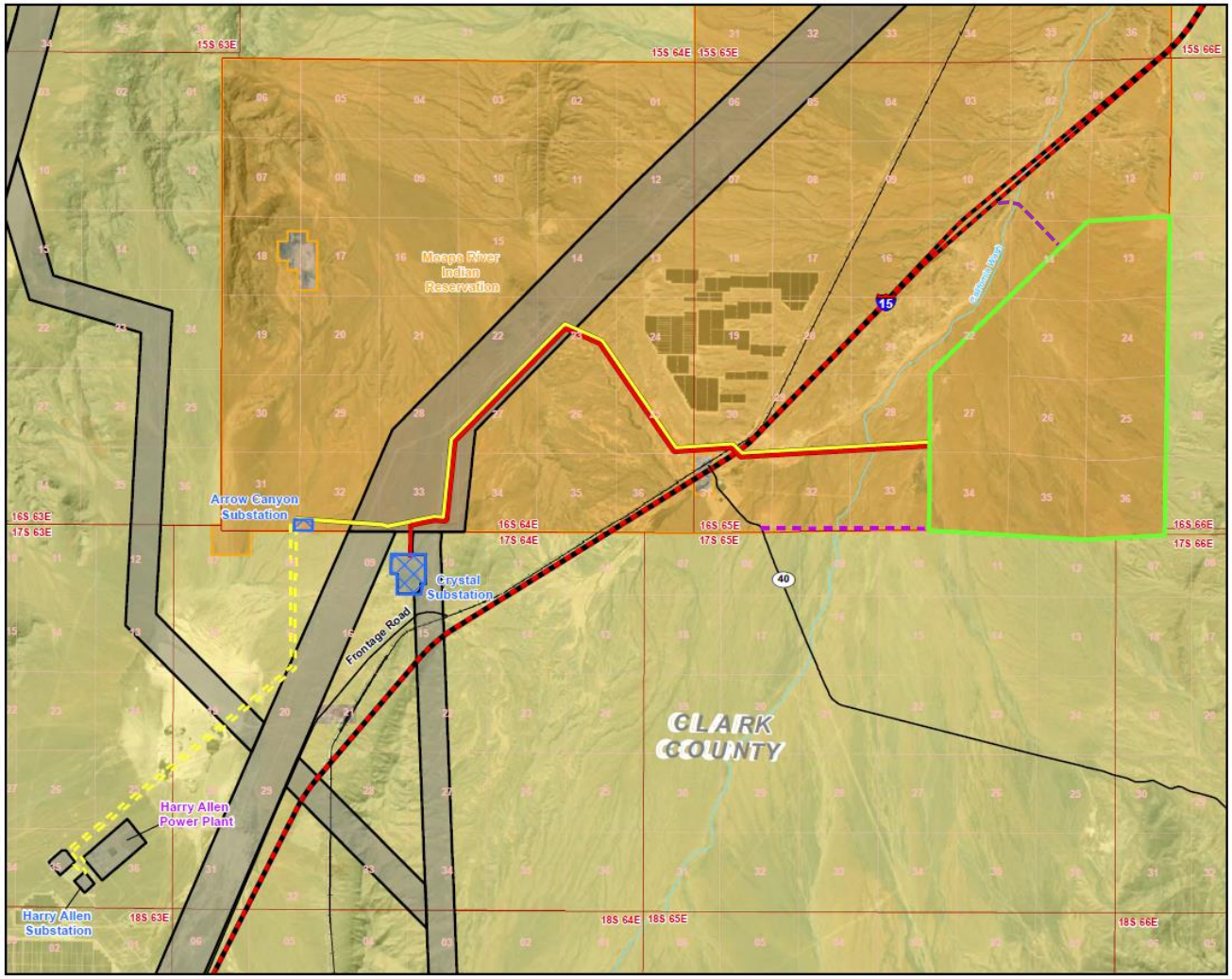
Project Location

Clark County, Nevada

Approximately 30 miles northeast of Las Vegas

Chuckwalla Solar Projects Description

- Four solar projects totaling 700 MWs within a 6,500-acre lease area on Reservation
  - Chuckwalla 1a and 1b (250MW), 2 (200MW), and 3 (250MW)
- Battery Energy Storage System (BESS)
- Gen-tie lines to interconnect at Crystal and Harry Allen Substations
  - ROWs from BIA and BLM
- Improvement to existing roads on Reservation for access
- Water provided by Moapa Band
  - Piped or trucked from off-site well or on-site well



Legend

Project Components

- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Approved ROW Arrow Canyon - Harry Allen

SOLAR FIELD
Township, Range, Section
T16S, R65E
Sections 13, 14, 22, 23, 24, 25, 26, 27, 34, 35, and 36

PV Solar Field

- Solar arrays
- Inverters (converts DC to AC current)
- Battery Energy Storage System (BESS)
- Electrical collection system
- Operation & Maintenance Building on site
- Fencing around the solar arrays

Chuckwalla Solar Projects
Off-Site ROWs

- Rights-of-Way (ROWs) for transmission gen-tie line, access roads, and water pipeline
  - Gen-tie lines to interconnect to Crystal and Harry Allen Substations
  - Improvement to existing access roads on Reservation
  - Potential temporary water pipeline

Potentially Impacted Resources

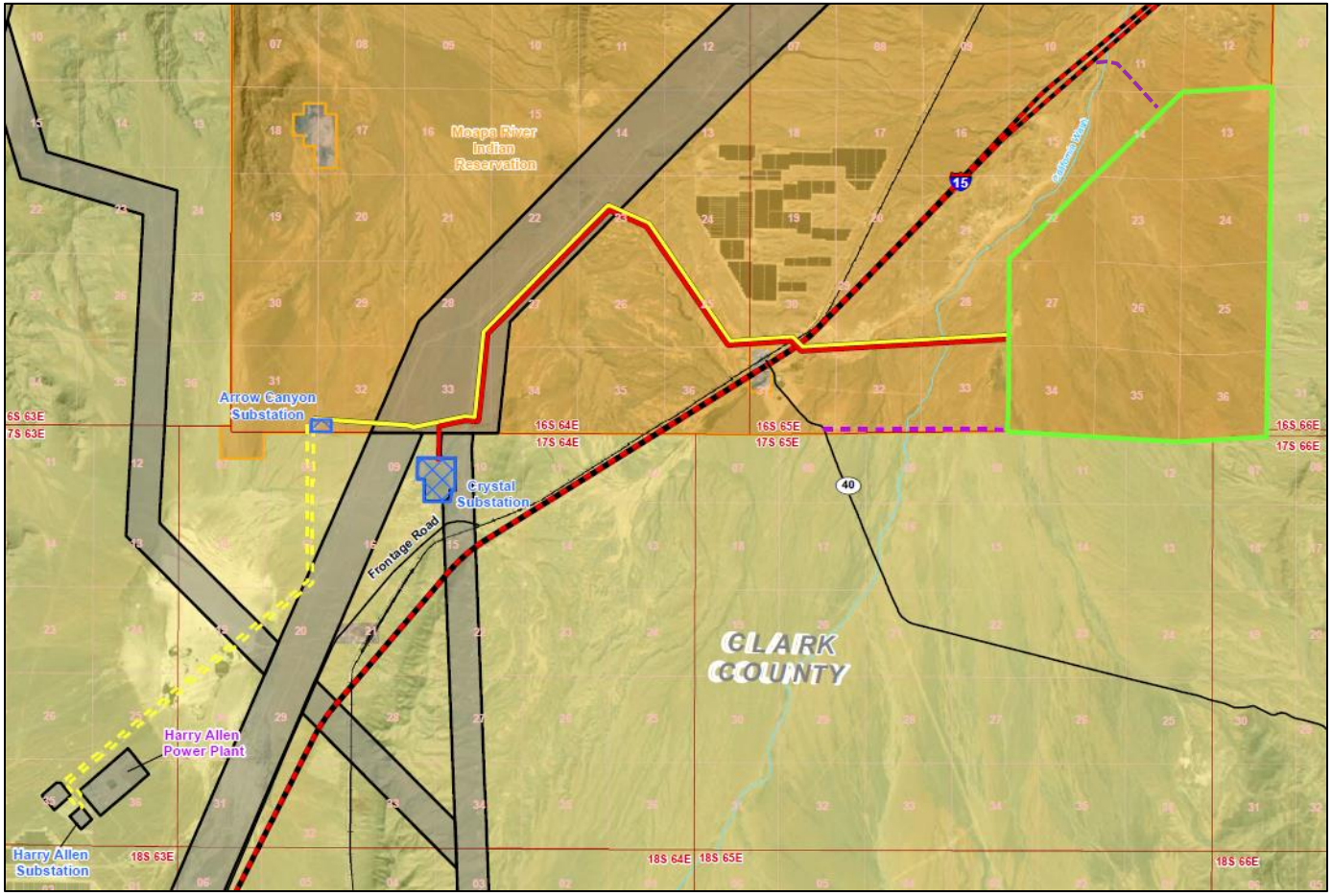
- Biological Resources
  - Desert Tortoise
  - Desert Vegetation
  - Avian Species
- Cultural Resources
- Visual Resources
- Water Resources
- Socioeconomics

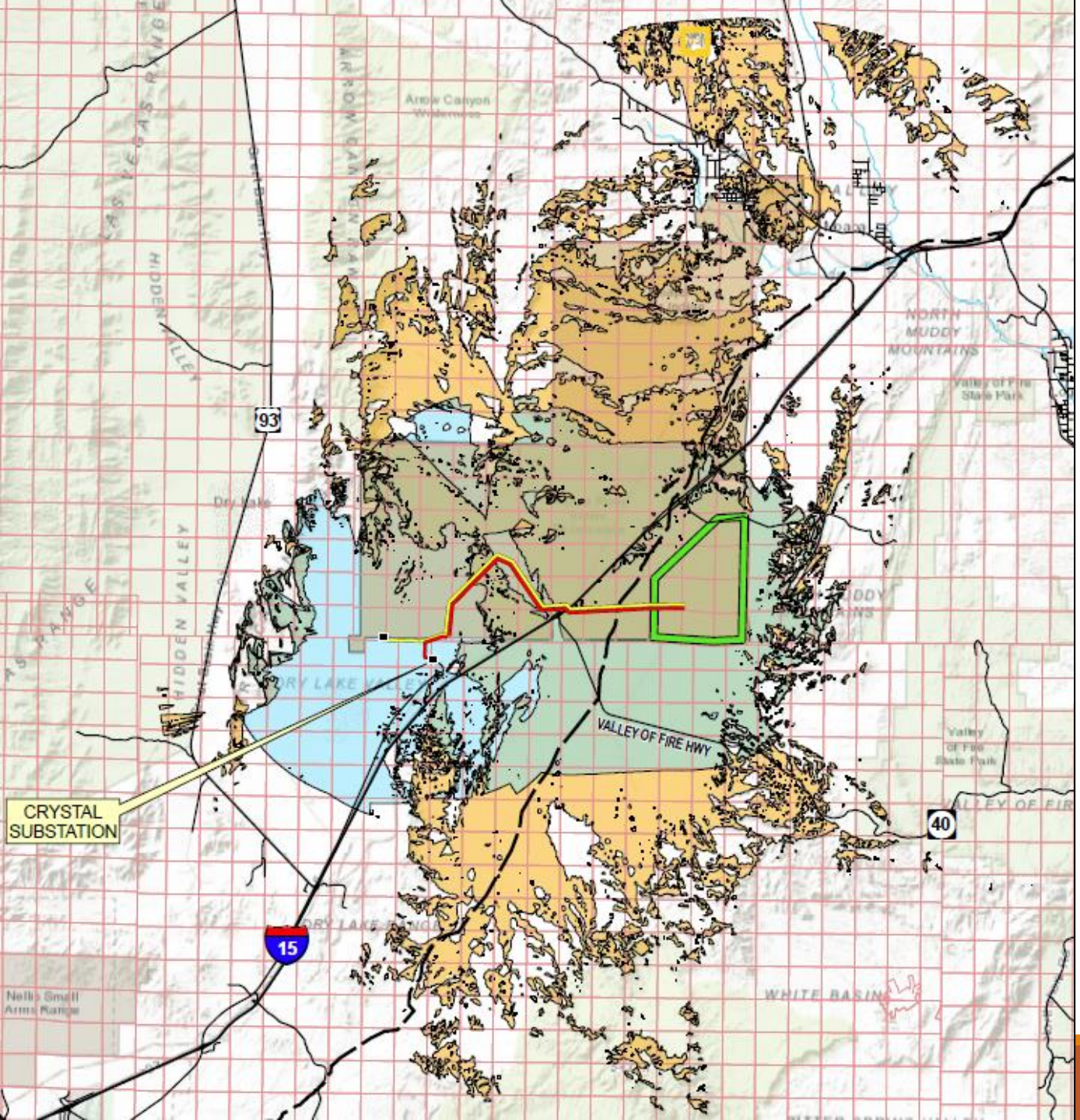
Decisions to be Made

Summary of Agency Decisions to be Made	
AGENCY	**ACTION**
BIA	Approval of solar energy ground lease and approval of ROWs for portions of the gen-tie lines and access roads located on the Reservation.
BLM	Approval of ROW for portions of the gen-tie lines within the BLM-managed designated utility corridor on Reservation land and federal lands south of the Reservation; and approval of ROW for use of existing access roads and gen-tie ROW located on BLM-managed federal land and within the BLM-managed designated utility corridor on Reservation land.
Reclamation	Approval of interconnection to the Crystal Substation that is partially owned by US government.

Other cooperating agencies will use the information in this EIS to support their analyses and decisions, as needed

Decisions / Jurisdictions





MOAPA RESERVATION

PROJECT BOUNDARY

GENTIE CORRIDOR

PROJECT VISIBILITY
15 MILE RADIUS

GENTIE VISIBILITY
5 MILE RADIUS

ROADS

OLD SPANISH TRAIL

SECTION LINES

RIVERS

N
W E
S

Project Visibility

Comments / Questions

? ? ? ? ?

- Contact Information:

  Chip Lewis
  BIA, Western Region
  Branch of Environmental Quality Services
  2600 North Central Avenue
  4th Floor Mailroom
  Phoenix, AZ 85004
  (602) 379-6750
  chip.lewis@bia.gov

- Project Website:

  www.ChuckwallaSolarProjectsEIS.com

Appendix D

Scoping Comments Received

CHUCKWALLA SOLAR PROJECTS SUMMARY OF SCOPING COMMENTS			
Commentor	**Comment #**	**Issue Category**	**Comment**
Environmental Protection Agency	A-1	Water Quality	Minimize grading to the greatest extent practicable
	A-2	Water Quality	Avoid floodplains and major drainages on the site
	A-3	Biology	Utilize desert tortoise fencing
	A-4	Air Quality Health & Safety	Utilize dust control to avoid worker health impacts
	A-5	Biology	Prevent and control the spread of invasive/noxious weeds
	A-6	Biology	Monitor and reduce impacts to birds
Clark County DES	B-1	Air Quality	Department of Environment and Sustainability (DES) does not have jurisdiction for enforcing air quality regulations within the Moapa River Indian Reservation.
	B-2	Air Quality	Where jurisdiction is applicable, a dust control permit be obtained prior to: (i) soil disturbing or construction activities impacting 0.25 acres or more in overall area…
	B-3	Air Quality	Where jurisdiction is applicable, construction project of ten (10) or more acres… a detailed supplement to the Dust Mitigation Plan is required
	B-4	Air Quality	Where jurisdiction is applicable, construction project of fifty (50) or more actively disturbed acres must have in place an individual designated as the Dust Control Monitor to ensure that dust control measures are implemented
Hopi Tribe	C-1	Cultural Resources	The Hopi Tribe defers to the Moapa Band
Old Spanish Trail Association	D-1	Cultural Resources	Concerned about potential impacts to the Old Spanish National Historic Trail
National Park Service	E-1	Land Use	Consider potential indirect effects to the Valley of Fire National Natural landmark (NNL)
Interagency Meeting Comments	F-1	Health & Safety	The DAF indicated that the visual and reflective aspect of the projects is their biggest concern
	F-2	Biology	USFWS would like all 4 projects covered in one biological assessment and biological opinion

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

A

May 20, 2021

Mr. Chip Lewis
BIA Western Regional Office
2600 North Central Avenue
4th Floor Mailroom
Phoenix, Arizona 85004

Subject: Scoping comments for the proposed Chuckwalla Solar Project on the Moapa River Indian Reservation, Clark County, Nevada

Dear Mr. Lewis:

The U.S. Environmental Protection Agency has reviewed the Federal Register Notice published on April 23, 2021 requesting comments on the Bureau of Indian Affairs' decision to prepare an Environmental Impact Statement for the subject project. Our comments are provided pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508) and our NEPA review authority under Section 309 of the Clean Air Act. EPA is a NEPA cooperating agency on the project.

The proposed solar photovoltaic (PV) project would be located on up to 6,400 acres of tribal trust land and would have a combined capacity of up to 700 megawatts (MW). Major components of each solar site would include multiple blocks of solar PV panels mounted on tracking systems, H-beam or pad mounted inverters, transformers, collection lines, battery energy storage systems (BESS), projects substation, and Operation and Maintenance facilities.

The EPA has the following recommendations for your consideration in preparing the Draft EIS. We recommend the Chuckwalla projects be designed to:

- **Minimize grading to the greatest extent practicable**. Grading alters soil stability and enables erosion. Minimizing grading and soil disruption will benefit several resources including water quality, air quality and worker health, and native vegetation from direct impacts and indirect impacts from invasive weed species. Please identify the strategy for grading and protecting vegetation (mowing, crush and roll, etc.) in the project description. 1
- **Avoid floodplains and major drainages on the site.** We commend BIA and the Tribe for not including the main channel of the California Wash in the project site. However, since it is located adjacent, a number of tributaries on the site that drain to the California Wash are located in the designated 100-yr floodplain. We recommend avoiding development in the 100-year floodplain as a minimum design standard. We also recommend providing as generous a buffer along the major tributaries as space allows, which would minimize water quality impacts, facilitate wildlife movement, and provide resilience to climate change effects from increased intensity of storms. Anticipate sedimentation that may be generated from construction of the large Gemini Solar 2

Project planned directly upstream. We request the preliminary hydrological study be included in the appendices. Additionally, identify whether any of these drainages would be considered a Water of the U.S. subject to Clean Water Act Section 404 permitting. Consider including the jurisdictional delineation in the appendices.

- **Utilize desert tortoise fencing.** This fencing will allow tortoise to reenter the site upon completion. Discuss the cumulative impacts to this species from solar projects on and off the Reservation when identifying the reasonably foreseeable environmental trends for this species and the other planned actions in the area (40 CFR 1502.15). 3

- **Utilize dust control to avoid worker health impacts.** While the project area is in attainment for the National Ambient Air Quality Standard (NAAQS) for particulate matter 10 microns in diameter or smaller (PM_{10}); fugitive dust is still a pollutant of concern that would be generated during construction, and dust control Best Management Practices should be utilized and enforced. Dust control is also important since the project site is located in an area that the Centers for Disease Control has determined is suspected endemic for Coccidioides immitis, a fungus causing Valley Fever in humans, and ground disturbing activities could result in dispersal of Coccidioides spores. Additionally, to the extent possible, identify the tentative construction schedule and indicate if it will overlap with construction of the other solar projects on the Reservation or the Gemini Solar Project to the south. If it will, a greater discussion of PM_{10} impacts from multiple projects should be considered when identifying the reasonably foreseeable environmental trends to air quality, even if short-term, and the other planned actions in the area (40 CFR 1502.15). 4

- **Rigorously prevent and control the spread of invasive/noxious weeds.** The EIS for the Gemini Solar Project, to be located to the south of Chuckwalla, indicates that noxious and non-native weed densities are unusually high in this area. Ensure the Weed Management Plan includes the latest information regarding the effectiveness of existing control measures including those utilized at the K-Road Solar project and in the utility corridor. Because of the widespread construction in the area and the pre-existing dense presence of weed species, we recommend a monitoring component be included in the Plan. 5

- **Monitor and reduce impacts to birds.** Discuss impacts to birds from the "lake effect", where birds may mistake the PV panels for water resulting in unexpected deaths from collisions with the solar panels. State whether this phenomenon has occurred at the operational K-Road facility and describe measures to minimize potential impacts. We recommend that the Bird and Bat Conservation Strategies include avian mortality monitoring and adaptive management measures. 6

We appreciate the opportunity to provide comments on the preparation of the DEIS. If you have any questions, please contact me at (415) 947-4178 or vitulano.karen@epa.gov.

Sincerely,

Karen Vitulano
Environmental Review Branch

cc: Laura Watters, Chairwoman, Moapa Band of Paiute Indians

DES
DEPARTMENT OF ENVIRONMENT AND SUSTAINABILITY
air quality | desert conservation PROGRAM | sustainability

4701 W. Russell Road 2nd Floor
Las Vegas, NV 89118-2231
Phone: (702) 455-5942 • Fax: (702) 383-9994
Marci Henson, Director

May 6, 2021

B

Mr. Chip Lewis
BIA Western Regional Office
2600 North Central Avenue
4th Floor Mailroom
Phoenix, Arizona 85004

Email: Chip.Lewis@bia.gov

Re: Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Chuckwalla Solar Projects on the Moapa River Indian Reservation, Clark County, NV

Dear Mr. Lewis:

The Department of Environment and Sustainability (DES) has reviewed the Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Chuckwalla Solar Projects on the Moapa River Indian Reservation, Clark County Nevada. The Moapa Band has requested that the Bureau of Indian Affairs (BIA) approve the solar energy ground lease and associated agreements between the Tribe as lessors to construct, operate and maintain, and eventually decommission four solar generating facilities using photovoltaic technology. The solar facilities will be located on the Reservation in Clark County, approximately 30 miles northeast of Clark County on up to 6,400 acres of tribal trust land. Two transmission generation interconnection (gen-tie) lines would be constructed to interconnect the Projects to the regional electrical grid. Portions of these lines would cross lands managed by the Bureau of Land Management (BLM) both within a designated utility corridor on the Reservation and on federal lands off the Reservation. The BIA and BLM would approve rights-of-way authorizing the construction and operation of the transmission lines.

Based upon the locations in your Notice of Intent, the project location is in attainment or is in an unclassifiable area for all criteria pollutants. (DES) does not have jurisdiction for enforcing air quality regulations within the Moapa River Indian Reservation. However, in preparing an EIS for the proposed project, regulatory requirements may apply depending upon the type of activities that will take place at the construction site. Particulate Matter with an aerodynamic diameter of 10 microns or less (PM_{10}) is the pollutant primarily associated with construction activities and there are several provisions of the Air Quality Regulations (AQRs) that regulate proposed construction within the Apex Valley (hydrographic areas 216 and 217): 1

Section 94 of the AQRs requires that a dust control permit be obtained prior to: (i) soil disturbing or construction activities impacting 0.25 acres or more in overall area, (ii) mechanized trenching of 100 feet or more in length, or (iii) mechanical demolition of any structure 1,000 square feet or more in area. When construction activities exist, Best Available Control Measures (BACM) must be employed. More information about the dust control regulations and required forms can be found at the link below: 2

http://www.clarkcountynv.gov/airquality/compliance/Pages/Compliance_DustForms.aspxf

Construction activities include, but are not limited to, the following practices: (i) land clearing, (ii) soil and rock excavation or removal, (iii) soil or rock hauling, (iv) soil or rock crushing or screening, (v) initial landscaping, (vi) establishing and/or using staging areas, parking areas, material storage areas, or access routes to or from a construction site.

Section 94 of the AQRs requires that a construction project of ten (10) or more acres, trenching activities of one mile or greater, or structure demolition using implosive or explosive blasting techniques, include a detailed supplement to the Dust Mitigation Plan. The supplement must be in the form of a written report and must, at minimum, provide a project description, the area and schedule of the phases of land disturbance, and the control measures and the contingency measures to be used for all construction activities. The supplement will become part of the dust control permit as an enforceable permit condition. 3

Section 94 of the AQRs also requires that any construction project of fifty (50) or more actively disturbed acres have in place an individual designated as the Dust Control Monitor to ensure that dust control measures are implemented, pursuant to the provisions of Section 94.7.5. In addition, an application for a Dust Control Permit for 50 acres or more shall contain a soil analysis of the entire project. 4

The following provisions of AQRs (90, 91, 92) shall apply to areas located in a PM10 non-attainment area, an area subject to a PM_{10} maintenance plan as defined under U.S. Code 7595a, or in the Apex Valley (Hydrographic Areas 216 and 217), and areas which are not regulated by section 94.

- Section 90 limits the emission of particulate matter into the ambient air from open areas or parking lots.
- Section 91 of the AQRs restricts the emission of particulate matter into the ambient air from unpaved roads, unpaved alleys, unpaved road easements, and unpaved access roads for utilities and railroads.
- Section 92 limits fugitive dust from parking lots and storage areas.

Section 12 of the AQRs requires the issuance of a stationary source permit for any applicable source located in Clark County that has a potential to emit a regulated pollutant that is equal to or greater than the thresholds listed in that section. For many solar projects the cleaning processes will exceed the thresholds.

For further assistance please contact me at (702) 455-3206 or the Small Business Assistance Program at (702) 455-1524.

Sincerely,

Araceli Pruett

Araceli Pruett, Senior Planner
Division of Air Quality

C

Paid 4/28/21 HCPO

United States Department of the Interior
BUREAU OF INDIAN AFFAIRS
Western Regional Office
2600 North Central Avenue
Phoenix, Arizona 85004-3008

IN REPLY REFER TO:
Environmental Quality Services
MS620-EQS

APR 26 2021

Honorable Timothy L. Nuvangyaoma
Chairman, Hopi Tribe
P.O. Box 123
Kykotsmovi, Arizona 86039

Dear Chairman Nuvangyaoma:

As Agency Official for purposes of Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), the Western Regional Office of the Bureau of Indian Affairs (BIA) wishes to consult with the Hopi Tribe about the proposed project: **approval of a lease for the Chuckwalla Solar Project (Project No. 2021-109)**, on the Moapa River Indian Reservation. The undertaking can be characterized as the construction of a 700-megawatt solar photovoltaic electricity generation facility on the Moapa River Indian Reservation. The ground lease for the solar facility would encumber up to 6,400 acres on land of the Moapa Band of Paiute Indians (see enclosed maps).

The BIA is serving as Lead Federal Agency as described at 36 CFR 800.2(a)(2) for the project. Consulting parties identified to date for this undertaking include the Moapa Band of Paiute Indians, Nevada State Historic Preservation Office, EDF Renewables Inc. (project proponent), Bureau of Land Management (BLM) Las Vegas Field Office, and the National Park Service (NPS). A cultural resource inventory report will be prepared for the proposed area of potential effects (APE).

Following provisions of the NHPA, we are seeking counsel with your office regarding the proposed undertaking to identify any concerns about historic properties; advice on our identification efforts and evaluation of historic properties; articulate views on the undertaking's effects; and participate in the resolution of any adverse effects. We specifically are asking to be advised if your Tribe attaches religious and cultural significance to any historic properties in the APE.

We look forward to your views on this project and other efforts we may employ to satisfy our responsibilities as prescribed by the NHPA.

MAY 2021
WESTERN REGIONAL OFC
ENVIRONMENTAL
SERVICES

If there are any questions, please contact Mr. Garry J. Cantley, Regional Archeologist, at (602) 379-6750 extension 1256 or by email at Garry.Cantley@bia.gov.

5-4-21
Letter to Moapa

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Sincerely,

RODNEY MCVEY Digitally signed by RODNEY MCVEY Date: 2021.04.19 12:35:17 -07'00'

Rodney McVey
Deputy Regional Director - Trust Services

Enclosures

cc: Superintendent, Southern Paiute Agency
Attn: Environmental Coordinator
Superintendent, Hopi Agency (w/enc)
Attn: Environmental Coordinator
Chairman, Moapa Business Council
Chairperson, Moapa Cultural Committee
Tribal Historic Preservation Officer, Hopi Tribe (w/enc)
Field Manager, Las Vegas Field Office, BLM
Cultural Resource Specialist, Nat'l Trails System-Intermtn. Reg., NPS
Director, Solar Development, EDF Renewables
Regional Realty Officer, WRO

D

May 20, 2021

Chip Lewis
Regional Environmental Protection Officer
BIA Western Regional Office
2600 North Central Avenue
4th Floor Mailroom
Phoenix, Arizona 8500

SUBJECT: Environmental Quality Services MS620-EQS

REGARDING: Scoping Comments - Chuckwalla Solar Project

Dear Mr. Lewis,

Thank you for reaching out to the Old Spanish Trail Association[1] in regards to the proposed Chuckwalla Solar Project (Project No. 2021-109 on the Moapa River Indian Reservation. With this letter we are confirming our interest to participate as a Consulting Party in regards to both National Environmental Protection Act (NEPA) and National Historic Preservation Act (NHPA) matters.

Please accept our scoping comments regarding the request for consultation received on April 22, 2021.

- OSTA is concerned this project directly impacts the Old Spanish National Historic Trail (OSNHT) in the California Wash area, a high potential segment identified in the 2017 OSNHT Comprehensive Administrative Strategy.
- OSTA is concerned your letter received April 22, 2021 makes no reference to NEPA or the National Trail System Act.
- OSTA is concerned about the cumulative impacts from solar project development in this area on the OSNHT designated by Congress in 2002.
- OSTA is concerned that a National Trail Management Corridor has not yet been developed for the OSNHT in this area.
- OSTA is concerned about the lack of public access for this trail segment.

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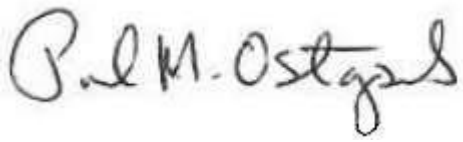
In addition to preparing a cultural resource report under NHPA, OSTA expects that an Environment Impact Statement (EIS) would be developed for public comment regarding a range of alternatives that avoid or otherwise suitably mitigate impacts to the OSNHT.

Thank you for the opportunity to participate as a Consulting Party for this project. We look forward to meaningful dialogue to address the issues outlined above.

OSTA Executive Director, Lynn Brittner, P.O. Box 629, Corrales, NM 87048-9582
ostamgr@gmail.com 805-729-6588 OldSpanishTrail.org



Paul Ostapuk President
Old Spanish Trail Association
postapuk@gmail.com
928.614.9655

[1]OSTA is a 501 (c) 3 organization whose mission is to study, preserve and protect, interpret and educate, and promote respectful use of the Old Spanish Trail (OST), the Old Spanish National Historic Trail (OSNHT) and closely related historic routes. OSTA is a designated volunteer organization for the OSNHT, recognized by both the National Park Service and BLM.

Cc:
Lynn Brittner, OSTA Executive Director
Glenn Shaw, OSTA Nevada Director
Garry L. Hayes, Law Office of Hayes and Welsh

E

From: Lewis, Charles
To: Patricia McCabe; Randy Schroeder
Subject: Fw: Valley of Fire National Natural Landmark information
Date: Thursday, May 06, 2021 7:45:32 AM
Attachments: Outlook-12wosrsk.png
2019 VAFI_NV_NNL Brief.pdf
Topo_NEW_Valley of Fire.pdf
Prog at a Glance_508_Final_2020.03.30.pdf

Chip Lewis
Regional Environmental Protection Officer
Branch of Environmental Quality Services
Bureau of Indian Affairs-Western Region
2600 N. Central Ave, Fourth Floor Mailroom
Phoenix, AZ 85004
Office: (602) 379-6750
Direct: (602) 240-8448
Cell: (602) 390-2014

From: Jenkins, Laurette Lee <Laurie_Lee_Jenkins@nps.gov>
Sent: Tuesday, May 4, 2021 11:29 AM
To: Lewis, Charles <Charles.Lewis@bia.gov>
Cc: Rozzell, Lara R <Lara_R_Rozzell@nps.gov>
Subject: Valley of Fire National Natural Landmark information

Chip,

It was nice talking with you this morning about the Valley of Fire National Natural Landmark. It is great that you are familiar with the Valley of Fire NNL designation. As we discussed, I am attaching the landmark brief and the VAFI-NV boundary map. I will get you GIS shapefile in a separate email.

Valley of Fire NNL is located southeast of both the Bighorn Solar Project (EQ-21/0012) and the Chuckwalla Solar Projects (ER-21/0025) proposed on the Moapa River Indian Reservation.

Thank you in advance for considering the Valley of Fire NNL designation as you move these projects forward. Please do not hesitate to reach out to me if I can provide additional information about the landmark. I understand that projects will not cause direct impacts to NNL but may have some indirect affects as the Chuckwalla Solar Project is proposed just north of the Valley of Fire access road.

1

Best,
Laurie

Laurie Lee Jenkins
Laurie_Lee_Jenkins@nps.gov

National Park Service
National Natural Landmarks Program
DOI Regions 8, 9, 10, 12
Lower Colorado Basin l Columbia-Pacific Northwest l California-Great Basin l Pacific Islands
360-305-9187 (work cell)

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Chuckwalla Solar Project EIS Agency Scoping Meeting

Meeting held virtually
Date: May 19, 2021
Time: 1:30 pm Pacific Time
Zoom Link: https://zoom.us/j/9041407949?pwd=UytFUU1PMEErNEw4UWx2UjVlQXZoQT09 Meeting ID: 904 140 7949 Passcode: CSP_2021
Join by Phone: (346) 248-7799 Phone code: 28011103

Attendees

Name	Position
BIA	
Chip Lewis	Regional Environmental Protection Officer
Garry Cantley	Regional Archaeologist
Christina Varela	Realty Specialist
Tamera Dawes	Regional Realty Specialist
Brian Bowker	Regional Director
BLM	
Matthew Klein	Environmental Planning Coordination, Southern Nevada
Beth Ransel	Supervisory Project Manager
Vivian Browning	Realty Specialist, Las Vegas Field Office
Robert Sweeten	National Historic Trails
EPA	
Karen Vitulano	U.S. EPA Region 9
NPS	
Jill Jensen	National Trails, cultural resources
Margaret Frisbie	National Trails, cultural resources
Laurie Lee Jenkins	National Historic Landmarks, Regions 9, 10, 12, and part of 8
BOR	
Mike Boyles	NEPA Coordinator, Region 8
Air Force	
Victor Rodriguez	Nellis AFB Community Partnerships
Bonnie Houghton	Senior Environmental Policy Analyst, Headquarters
USFWS	
Kelly Douglas	Senior Biologist, Southern Nevada Field Office
Glen Knowles	Southern Nevada Field Supervisor
NDOW	
Jasmine Kleiber	Technical Review Program and Renewable Energy Program
NDOT	
My-Linh Nguyen	Chief of Environmental Division, NDOT
Clark County	
Nancy A. Amundsen	Director, Comprehensive Planning

Name	Position
Consultants	
Randy Schroeder, ENValue	NEPA lead
Pat Golden, Heritage Environmental	Biology lead
Mary Barger, Logan Simpson	Archaeology lead
Patricia McCabe, Logan Simpson	BIA NEPA support
Lisa Young, Logan Simpson	BIA NEPA support

Agency Questions/Comments

Chip and Randy provided a presentation describing the proposed project.

Gary explained the findings from cultural resource surveys. Will have a draft of the survey report by end of June. SHPO consultation has been initiated. Tribal consultation in progress.

Pat shared a photo showing the project area including an existing road that runs through the site. The site is relatively flat. Has completed survey for desert tortoise, burrowing owl, and Gila monster. There are some drainages that cross the site, intent is to avoid them as much as possible. Pat also shared a map depicting the locations where desert tortoise was found on the site. 42 tortoises were found in solar lease area. 4 tortoises were found along proposed gen-tie routes.

Karen asked about jurisdictional delineation (JD) and whether it has been completed. Pat indicated that it is complete and none of the washes are jurisdictional under the current rules. Under the old rules, there are a few that connect with California wash that may have been jurisdictional. The project does avoid California Wash. Access roads do cross California Wash, but no improvements are needed on those roads. Karen asked if there is a map showing the boundary for each project. Randy indicated that we do not have each of the project boundaries yet, EDF Renewables is still working on this.

Chip asked how many acres will be involved for the solar fields within the 6,500 acres lease area. Randy indicated that we do not have this yet, but all resource studies were conducted over the entire 6,500 acres.

Karen asked if the Gemini Solar project will be used to support analysis. Pat indicated yes, but they have not conducted rare plant surveys because these surveys have not been required on the solar projects on the reservation. Surveys for noxious weeds were completed, as well as habitat assessments. There were no listed plant species in the area from the U.S. Fish and Wildlife Service (USFWS) Information Planning and Consultation (IPAC) species list. Karen indicated there may be sensitive species. Chip indicated that any BLM requirements that do not apply to the reservation will be addressed for the portions on BLM land.

Jasmine mentioned mowing of vegetation rather than completely clearing, and what was approved for Gemini. Suggests looking at Gemini to ensure similar protocols. Chip indicated that the Eagle Shadow Mountain Solar Project (ESMSP) was concurrent with Gemini, and the same treatment of vegetation that was used for ESMSP was also used for Gemini. Arrow Canyon Solar also used the raised fence, mowing, and drive and crush treatment of vegetation. But we don't know how effective this is yet. ESMSP is under construction and hopefully we can get an understanding on how effective this protocol

is. The Chuckwalla Projects will also use the same protocol, and the projects also have a comprehensive monitoring process to monitor effectiveness. Jasmine indicated that this treatment is encouraging even though we don't know effectiveness yet.

Bonnie (Air Force) indicated that the visual and reflective aspect of the projects is the biggest concern for them. Asked about size of current solar projects in place and cumulative size of full set of arrays. Also, asked about materials if reflection would be similar. Randy indicated the solar fields will be similar to all other projects in area regarding reflection, size of panels, and how they are oriented (north-south orientation and tilts to follow the sun). Bonnie asked about availability of the Records of Decisions (RODs) for the previous projects. Randy indicated that the previous EISs and RODs are available on the Chuckwalla solar website. Bonnie also mentioned special activity areas and fly spaces and Bonnie will share the information for consideration in the EIS.

Chip presented a map identifying the other solar projects on the reservation.

Robert indicated that he is available to help with the considerations for the Old Spanish Trail. The Old Spanish Trail was problematic on the Gemini project and he would like to help however he can. Chip indicated the other solar projects on the other side of the highway didn't have as much of an issue for the Old Spanish Trail, but for Chuckwalla Solar it will be an issue, as well as a visual issue, and BIA will accept any help they can get.

Meg with National Trails asked about cultural survey boundary. Garry responded that survey was in the lease area, and visual analysis was conducted out to 15 miles. Visual analysis also included 5 miles from gen-tie and access roads. Chip indicated that BIA is looking for input on Key Observation Points (KOPs) for visual analysis.

Garry asked about the historic trail and that the trail system is a congressional act and a NEPA issue, not an NHPA concern. Robert clarified that it applies to NHPA if trail is recorded as a historic property but also have to deal with the national trail designation. Jill Jensen indicated that for Gemini, the trail dealt with NEPA and Section 106. For the Chuckwalla projects, Jill indicated that NEPA is likely the only part that would apply. Robert indicated that there is some debate on what is included as the historic trail so if you find something, send to national trails for their review.

Randy discussed the ridge line east of the project and visibility of the project from Valley of Fire road.

Beth with BLM commented that there have been a number of gen-tie routes already in the BLM-managed designated utility corridor and more are permitted. It would be helpful to have a corridor study that shows existing and proposed uses to make sure we are not causing conflicts or precluding future use. Randy indicated that they may not have everything that BLM has, but can provide what they do have and send to BLM for review. Beth indicated that this would be useful. Randy will get started on this.

Vivian indicated that the application for the gen-tie lines were applied for by Chuckwalla Solar LLC and EDF Renewables is the manager of Chuckwalla Solar. The applicant is Chuckwalla Solar LLC, not EDF Renewables. Chip explained that the developer and tribe combine to form the LLC which then becomes the applicant.

Glen Knowles commented that USFWS would like all 4 projects covered in one biological assessment and biological opinion. Chip indicated that EDF Renewables would also like one document, and they are double checking with their legal team on this. Chip said he is doing everything they can to make this work. Kelly mentioned that for another project (Yellow Pine Solar) they were able to do two owners under one opinion. Chip indicated that another team meeting may be needed to ensure that the projects are differentiated clearly, especially with monitoring. Kelly said they can get with the Desert Tortoise Recovery Office (DTRO) in regards to the translocation plan. Any early conversation on this would be beneficial. Pat indicated he has discussed with Roy at DTRO and he is fine with however USFWS would like to proceed. Jasmine requested that NDOW also be included on those calls.

Jasmine would like to remind that if translocation of desert tortoise is required, a state permit is required. Jasmine also mentioned the Gila monster protection protocols. Pat indicated he has these already and will make sure they are included.

Jasmine also asked about when cooperating agency Memorandums of Understanding (MOUs) would be sent out. Chip indicated that for Department of Interior (DOI) agencies, an MOU is not needed. BIA is working on getting out the non-DOI agency MOUs out as soon as they can.

Chip mentioned how BIA is proceeding under revocation of secretarial orders. BIA plans to continue under the one federal agency process (one ROD). Beth is fine without additional MOU paperwork, but will double check regarding the single ROD vs. multiple RODs. Michael (Bureau of Reclamation) indicated they are likely fine with a single ROD, but will confirm.

Chip indicated that in light of streamlining and meeting the Power Purchase Agreement (PPA) for the projects, has found that it is helpful to roll out chapters as they are ready, so BIA plans to do this for the project. Chapter 1 will be out soon.

Beth would like a map showing the projects, solar fields, and gen-tie lines.

Pat asked about the status of construction of Gemini. BLM indicated that fencing is in progress, working on tortoise translocation, and construction is scheduled in the fall.

Action Items

Item No.	Assigned to	Description
1	Bonnie Houghton	Bonnie will share the special activity areas and fly spaces for consideration in the EIS
2	Randy Schroeder	Randy to provide BLM a map identifying the known power lines within the BLM-managed designated utility corridor.
3	Beth Ransel	Beth Ransel to review the map provided by Randy and add any additional uses of the designated utility corridor.
4	Randy Schroeder/Pat Golden	Schedule a meeting with USFWS to discuss how the Biological Assessment and Biological Opinion would be structured to include all 4 projects in a single document.
5	Randy Schroeder	Send Beth a map depicting the Chuckwalla solar projects, solar fields, and gen-tie lines.

The above meeting notes summarize the substantive items discussed or issues resolved at the above meeting. Participants are encouraged to review these notes and respond to Logan Simpson within five business days of the distribution date of these notes if any discrepancies exist. If no comments are received by this time, it will be assumed that these notes accurately reflect the substantive content of the meeting.

Appendix C

Project Design Features / BMPs

APPENDIX C

APPLICANT-PROPOSED MITIGATION MEASURES

Soils

The Proposed Project could result in adverse impacts to soils as a result of increased erosion rates and reduction of soil productivity from removal of vegetation and grading activities. The Applicant would implement the following mitigation measures to reduce overall impacts to soil resources:

- Grading on the solar site would be minimized to only those areas where necessary to meet the construction and operational requirements of the Project. Where no grading occurs, existing vegetation would be mowed to a height of approximately 18 inches and driven over / crushed during construction activities where feasible and where it does not pose a safety risk. Following construction, on-site vegetation will be allowed to return to those areas and will only be mowed to avoid conflicts with solar facility operation and as necessary for safety and fire prevention.
- Construction and operational activities will be conducted in compliance with a surface water protection plan (SWPP) that would include BMPs and other erosion-control measures designed to minimize soil erosion and limit sheet flow and downstream sedimentation. The SWPP would also incorporate adaptive management of actions if erosion and sedimentation control measures are found to be insufficient to control surface water at the site.
- To minimize wind erosion, all construction activities shall comply with the Fugitive Dust Control Plan that would be developed and implemented for the Proposed Project. Measures such as watering, application of dust palliatives, and ‘stop work’ periods during high winds would be incorporated into the plan.
- A Site Restoration and Revegetation Plan would be implemented to limit impacts to native, on-site vegetation as much as practicable. The Plan would define construction limits and BMP measures for soil restoration and re-planting and establish monitoring and success criteria as applicable.

Water Quality / Quantity

Potential adverse impacts to water are related to soil erosion and downstream sedimentation as well as water transport of hazardous material through soil erosion. As mentioned above, soil erosion would be managed via the SWPP and erosion controls within ephemeral washes to reduce velocity of flood flow and limit downstream sedimentation. The measures below would be implemented to reduce overall impacts to water quality:

- Grading on the solar site would be minimized to only those areas where necessary to meet the construction and operational requirements of the Project – such as where leveling is necessary, the driveways among the rows of panels, etc. The major existing

drainage channels that traverse the site will be retained by the site design and scour protection along these drainages would be installed as needed. Ephemeral drainage of the site would sheet flow into the existing drainage channels.

- Final grading and drainage plans will be completed and submitted for approval prior to construction. The final drainage and grading plans would demonstrate that downstream flows would not be adversely impacted due to any proposed changes to natural washes resulting from proposed grading, drainage management measures or the addition of retention ponds.
- The paths for all stormwater flows would be identified and modeled as part of the final grading and drainage plan.
- The number of drainage crossings would be minimized to the extent possible and each would be designed to accommodate adequate flow.
- Adaptive management techniques will be implemented via the SWPP to maintain BMPs utilized to decrease sediment erosion and downstream transport of such during large rain events.
- Weekly and post-storm monitoring of erosion and sedimentation would be conducted during construction. If localized gullies were to develop or result in increased rates of erosion and sedimentation, repairs would be made and erosion and sedimentation control measures would be updated.
- Existing vegetative buffers would be maintained as much as practical along perimeter edges of major drainages.
- Placing Project solar facilities in major washes would be avoided by all alternatives to minimize direct and indirect impacts to the washes from erosion, migration of channels and local scour. All larger Project components will be located outside of drainages. Some roads and collector lines could be placed within ungraded drainages where technically feasible.
- Where fencing would be built across drainages, breakaway fencing would be installed and would be designed to avoid interference with flows through those drainages. Breakaway fencing would be inspected and repaired as needed within 48 hours of large flood events.
- A spill prevention counter-measure and control (SPCC) plan would be developed and implemented during construction and the operations phase of the Proposed Project. Adequately-sized secondary spill containment would be incorporated with all chemical storage vessels to ensure proper capture and control measures for potential spills. The Plan would also provide for hazardous material spill prevention and clean-up measures, were a spill to occur.

Air Quality

The primary impact upon air would occur during the construction and decommissioning periods from increased vehicle emissions and fugitive dust. The following mitigation measures would be incorporated into construction contracts by the Proponent and would be implemented to reduce overall air impacts that would result from the Proposed Project:

- Grading on the solar site would be minimized to only those areas where necessary to meet the construction and operational requirements of the Project. Where no grading

occurs, existing vegetation would be mowed to 18 inches and driven over / crushed during construction where feasible and where it does not pose a safety risk. Following construction, on-site vegetation will be allowed to return to those areas not directly disturbed by project components and will only be mowed to avoid conflicts with plant operation and as necessary for safety and fire prevention.

- Vehicular speeds on non-paved roads would be limited 25 miles per hour.
- When hauling material and operating non-earthmoving equipment, spillage would be prevented and speeds would be limited to 15 miles per hour and speed of earth-moving equipment to 10 mph.
- Grading operations would be phased where appropriate to limit the amount of disturbance at any one time, and water trucks would be used for stabilization of surfaces under windy conditions. Soil stabilizers and dust palliatives would be used where practical.
- Water would be applied to disturbed areas to control dust and to maintain moisture level at optimum levels for compaction, as needed. Water will be applied using water trucks and application rates would be monitored to prevent runoff and ponding.
- Exposed stockpiled material areas would be covered or stabilized using water or other feasible methods during windy conditions (forecast or actual wind conditions of approximately 25 miles per hour or greater).
- Dust control measures such as watering and the application of palliatives approved by the USFWS would be applied to access roads and other Project roads to adequately control fugitive dust.
- Excavation and grading would be suspended during periods of high winds over 25 miles per hour.
- All trucks hauling soil and other loose material would be covered or at least 2 feet of freeboard would be maintained.
- All paved roads would be kept clean of mud, dirt, or debris, as necessary. Gravel or other similar material would be used where non-paved access roads intersect paved roadways to prevent mud and dirt track-out.
- Air pollutant emissions from the emergency diesel generators and/or fire water pump engines would be minimized by an operating limitation of no more than 50 hours per year, per engine for routine testing and maintenance of these components. These engines would be compliant with current EPA tier emission performance criteria.
- In construction contracts, recommend that all contractors maintain and tune engines per manufacturer’s specifications to perform to EPA certification levels, where applicable.
- Any tampering with engines would be prohibited and continuing adherence to manufacturer's recommendations would be required.
- In construction contracts, recommend that contractors lease new, clean diesel burning equipment. In general, the best available emissions control technology would be used - Tier 4 engines should be used for project construction equipment to the maximum extent feasible.
- Limit unnecessary idling and perform periodic and unscheduled inspections to ensure that construction equipment is properly maintained.
- In construction contracts, recommend that contractors use EPA-registered particulate traps and other appropriate controls where suitable to reduce emissions of diesel particulate matter and other pollutions at the construction site.

- A traffic and parking management plan would be developed for the construction period to minimize traffic interference and maintain traffic flow.

Biological Resources

The following measures will minimize, reduce, and mitigate impacts to biological resources from implementation of the Proposed Project:

T&E Species Mitigation Measures

ADDITIONAL MEASURES TO BE PROVIDED BY USFWS VIA BO FOR THE PROJECTS

General Biological Mitigation Measures

- Preconstruction surveys will be conducted by qualified biologists according to the most current USFWS or other applicable protocols, where available, by species. These surveys would confirm the presence of special status plants, noxious weeds, and general and special status wildlife species, to help prevent direct loss of vegetation and wildlife and to prevent the spread of noxious plant species.
- Biological monitors will be assigned to the Proposed Project in areas of sensitive biological resources Biological monitors would be in place along the access road during construction and/or temporary fencing utilized during the construction period to minimize any impacts from vehicles during construction. The monitors will be responsible for ensuring that impacts to special status species, native vegetation, wildlife habitat, or unique resources would be avoided to the fullest extent possible. Where appropriate, monitors will flag the boundaries of areas where activities would need to be restricted to protect native plants and wildlife or special status species. Those restricted areas will be monitored to ensure their protection during construction.
- The Applicant will monitor establishment and functionality of sediment control devices as outlined in the SWPP. Placement of these devices may need to be adjusted and placed further from roads to minimize risk to tortoises using them for shade. Ensure that BMPs are in place and working properly on a weekly basis.
- The Applicant will implement controls at entry locations to facilitate weed management and invasive species control in order to minimize infestation to the Proposed Project site from an outside source. Trucks and other large equipment will be randomly checked before entering the site for any invasive species debris or seed.
- The Applicant will pay a fee based on acreage of disturbance to the Tribe for disturbance of Tribal lands. The fees will be assessed at a rate to be determined by the Tribe, BLM, and Service who will agree upon how the funds will be spent prior to initiation of consultation and included in the proposed action for the Biological Opinion. Funds will be used to implement conservation measures established in the Reservation-wide desert tortoise management and conservation plan prepared for the K Road Moapa Solar Project and approved by the Tribe, BIA, and Service.

- Any trenches or excavations should be covered if left overnight or have escape ramps to allow wildlife to safely exit.
- Monitoring for the presence of ravens and other potential human-subsidized predators of desert tortoises will be conducted and a Raven Control Plan will be implemented. BMPs to discourage the presence of ravens onsite include trash management, elimination of available water sources, designing structures to discourage potential nest sites, use of hazing to discourage raven presence, removal of nesting material prior to an egg being laid, and active monitoring of the site for presence of ravens.
    - To minimize activities that attract prey and predators during construction and operations, garbage will be placed in approved containers with lids and removed promptly when full to avoid creating attractive nuisances for wildlife. Open containers that may collect rainwater will also be removed or stored in a secure or covered location to not attract birds.
- All work area boundaries will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers, equipment, vehicles, and construction materials shall remain within the site, existing roads, and designated areas.
- All transmission towers and poles will be designed to be avian-safe in accordance with the *Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006* (Avian Power Line Interaction Committee [APLIC] 2006) and *Reducing Avian Collisions with Power Lines* by the U.S. Fish and Wildlife Service and the APLIC (APLIC 2012)Vegetation clearing and ground-disturbing activities would be conducted outside the migratory bird nesting season when practical. If ground-disturbing activities cannot be avoided during this time period, a qualified biological monitor will conduct pre-construction nest surveys.
    - For all bird species, surveys would cover all potential nesting habitat in and within 300 feet of the area to be disturbed (as landowner access allows). Any disturbance or harm to active nests would be reported within 24 hours to the USFWS. The biological monitor would halt work if it is determined that active nests are being disturbed by construction activities and the appropriate agencies would be consulted.
    - Qualified biologists would relocate or destroy bird nests only after young have fledged and perform any mitigation measures necessary to reduce or eliminate negative effects to birds inhabiting the construction area.
- A qualified biologist will conduct pre-construction surveys within 30 days prior to construction for Western Burrowing Owls within suitable habitat during the breeding season (February 1 through August 31). All areas within 250 feet of the Proposed Project would be surveyed (if landowner access allows), per USFWS 2007 Burrowing Owl guidance (USFWS 2007).
    - If an active nest is identified, there would be no construction activities within 250 feet of the Burrowing Owl nest location to prevent disturbance until the chicks have fledged or the nest has been abandoned, as determined by a qualified biologist. Buffers may be increased or reduced as needed with the approval of the USFWS.

- The occurrence and location of any Western Burrowing Owls would be documented by biological monitors in daily reports and submitted to the authorized biologist on a daily basis. The authorized biologist will report all incidents of disturbance or harm to Burrowing Owls within 24 hours to the USFWS.

- Lighting will be designed to provide the minimum illumination needed to achieve O&M objectives and not emit excessive light to the night sky by installing light absorbing shields on top of all light fixtures, and focusing desired light in a downward direction (Reed et al. 1985). This would reduce the visibility of the lights to migratory birds traveling through the area. Downward facing lights would also reduce the number of insects attracted to lights resulting in a decrease of potential concentrated feeding areas for bats. Any additional lighting needed to perform activities such as repairs would be kept to a minimum and only used when these actions are in progress.

- A Worker Environmental Awareness Program (WEAP) will be prepared. All on-site personnel will be required to participate in WEAP training prior to starting work on the Proposed Project. The WEAP training will include a review of the special status species and other sensitive resources that could exist in the Proposed Project, the locations of sensitive biological resources and their legal status and protections, and measures to be implemented for avoidance of these sensitive resources. A record of all trained personnel will be maintained.

  Construction vehicles and equipment will be cleaned of soil and plant material prior to entering and leaving the work site to minimize the introduction and spread of weeds.

- The following measures are intended to mitigate potential impacts to Gila monsters:
  - Field workers and personnel will know how to: (1) identify Gila monsters and be able to distinguish it from other lizards such as chuckwallas and western banded geckos; (2) report any observations of Gila monsters to the NDOW; (3) be aware of the consequences of a Gila monster bite resulting from carelessness or unnecessary harassment; and (4) be aware of protective measures provided under state law and federal management policies.
  - Live Gila monsters found in harm's way on the SPGF site will be captured and then detained in a cool (<85°F), shaded environment (air-conditioned vehicle or trailer is okay) by the project biologist or equivalent personnel until a NDOW biologist can arrive for biological documentation prior to releasing. Although a Gila monster is venomous and can inflict a serious bite, its relatively slow gate allows for it to be easily coaxed or carefully lifted into an open bucket or box using a long-handled instrument like a snake hook, tongs or shovel (*Note: it is not the intent to request unreasonable action to facilitate captures; additional coordination with NDOW will clarify logistics*). For safe detainment, an unused or sterile 5- gallon plastic bucket with a secure, vented lid; an 18"x18"x4" plastic sweater box with a secure, vented lid; or, a tape-sealed cardboard box of similar dimension may be used for safe containment. Additionally, written information identifying the mapped capture location, GPS coordinates in Universal Transverse Mercator (UTM) using the North American Datum (NAD) 83 Zone 11. Date,

time, and circumstances (e.g. biological survey or construction) and habitat description (vegetation, slope, aspect, substrate) will also be provided to NDOW.

- Injuries to Gila monsters may occur during excavation, road grading, or other construction activities. In the event a Gila monster is injured, it should be transferred to a veterinarian proficient in reptile medicine for evaluation and appropriate treatment. Rehabilitation or euthanasia expenses will be covered by the Applicant. NDOW will be immediately notified of any injury to a Gila monster and which veterinarian is providing care for the animal. If an animal is killed or found dead, the carcass will be immediately frozen and transferred to NDOW with a complete written description of the discovery and circumstances, date, time, habitat, and mapped location (GPS coordinates in UTM using NAD 83 Zone 11).
- Should NDOW's assistance be delayed, biological or equivalent acting personnel on site should detain the Gila monster out of harm's way until NDOW personnel can respond. The Gila monster should be detained until NDOW biologists have responded. Should NDOW not be immediately available to respond for photo-documentation, a digital camera will be used to take good quality images of the Gila monster in situ at the location of live encounter or dead salvage. The pictures will be provided to NDOW with specific location information including GPS coordinates, date, time and habitat description. Pictures will show the following information: (1) Encounter location (landscape with Gila monster in clear view; (2) a clear overhead shot of the entire body with a ruler next to it for scale (Gila monster should fill camera's field of view and be in sharp focus); and (3) a clear, overhead close-up of the head (head should fill camera's field of view and in sharp focus.

- A Facility Decommissioning Plan would be developed and provided to the Tribe and BLM addressing the Project facilities under their respective management. This plan would be submitted for approval at least six months prior to commencement of site closure activities.
- Potential closure activities could include re-grading and restoration of original site contours and re-vegetation of areas disturbed by closure activities in accordance with the Site Restoration Plan. Revegetation seed mixes will be composed of native plant species.
- Any and all additional measures identified in the Biological Opinion to mitigate impacts to sensitive species will be implemented as prescribed.

Cultural Resources

The following mitigation measure would be implemented as needed:

- Should any unrecorded and unanticipated cultural resources be discovered during construction, all activities within the immediate area of discovery shall cease. The Chairman of the Moapa Tribal Council and the BIA Regional Archeologist shall be notified immediately and, consulting with BLM and SHPO as appropriate, they will make

arrangements to assess the nature of discovered cultural resources and mitigate any effects resulting from the unanticipated discovery.

Transportation

The short-term impacts to traffic during construction would be reduced by implementing the following mitigation:

- A Traffic Management Plan for the construction period would be finalized that identifies BMPs to minimize construction-related traffic impacts.
- Deliveries of materials would be scheduled for off-peak hours, when practical, to reduce effects during periods of peak traffic. Delivery personnel would be provided with an abbreviated WEAP tailored to their limited access to the Project Site.
- Truck traffic would be phased throughout construction, as much as practical.
- Carpooling or mass transportation options for construction workers would be encouraged.
- If required, before construction, the Applicant and agency representatives will document the pre-construction condition of the approximately 3 miles of access route (N Las Vegas Blvd), noting any existing damage, with the Applicant responsible for its fair-share of costs to perform the assessment. After construction, the Applicant shall pay its fair-share of estimated costs to restore the access route to its pre-construction condition, as determined by the agency representatives, and subject to adjustment after actual costs are incurred. “Fair-share” in this context means that portion of repair costs attributable to damage to the road caused by activities conducted by or on behalf of the Applicant, as opposed to damage caused by the activities of other users of the same road.

Public Health & Safety

The potential for exposure to hazards exists during transportation of materials, direct handling of substances, inadvertent release of hazardous material to the soil and groundwater, and general fire and electrical hazards. In addition to the previously discussed SPCC Plan, the Applicant would implement the following measures to reduce significant impact to public health and safety:

- General Design and Construction Standards - The Project would be designed in accordance with all applicable engineering and construction standards and guidelines.
- Health and Safety Program - All employees and contractors would be required to adhere to appropriate health and safety plans and emergency response plans. All contractors would be required to maintain and carry health and safety materials including the material safety data sheets (MSDSs) of hazardous materials used on site.
- Emergency Response Plan - An Emergency Response Plan would be developed and implemented based on the results of a comprehensive facility hazard analysis.
- Waste Management Plan - A waste management plan would be developed describe the storage, transportation, and handling of wastes and emphasize the recycling of construction wastes where possible.

- The Project would coordinate with the holders of all existing ROWs that would be crossed or paralleled by the Project ROWs (transmission lines, access roads, water pipeline) to minimize encroachment conflicts and possible effects to existing transmission lines and pipelines.
- The Project would incorporate measures to reduce potential worker exposure to the *Coccidioides immitis* fungus that can cause Valley Fever.

Appendix D

Plan of Development (POD)

PLAN OF DEVELOPMENT
CHUCKWALLA SOLAR GEN-TIE LINES
Casefile No. N-XXXXX

Clark County, Nevada

Project Applicant:

Chuckwalla Solar, LLC

Submitted to:

Bureau of Land Management
Las Vegas Field Office
4701 North Torrey Pines Drive
Las Vegas, Nevada 89130

UPDATED
July 2021

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TABLES

FIGURES (in Section 6)

1.0 PROJECT DESCRIPTION

Introduction

Chuckwalla Solar, LLC. (CHW) has entered into an option agreement with the Moapa Band of Paiute Indians (Moapa Band or Band) to lease lands on the Moapa River Indian Reservation (Reservation) in Clark County for the development of up to four solar projects collectively referred to as the Chuckwalla Solar Projects. These projects would total up to 700 megawatts (MWs) of solar energy generation using photovoltaic (PV) technology and incorporating battery energy storage systems (BESS). **Figure 1-1** shows the proposed general location approximately 30 miles northeast of Las Vegas and east of I-15.

Two new gen-tie lines requiring new rights-of-way (ROWs) and construction would interconnect the solar projects to the regional electrical grid – one to connect with the existing Harry Allen substation and one to the existing Crystal Substation. These lines would be built parallel to one another for most of their length (3.8 miles on BLM jurisdiction) within the designated utility corridor on the Reservation that is managed by BLM. From that common point, the line to Harry Allen would continue within the utility corridor on the Reservation for an additional 0.5 miles and the line to the Crystal would continue on BLM-managed federal lands for approximately 0.7 miles. To connect to the Harry Allen Substation, the Projects also request ROW for connection with, access to, and maintenance of the approved line between the Arrow Canyon Solar Project and the Harry Allen Substation (N- 88870) - also on BLM-managed federal lands.

The gen-tie line to connect with Harry Allen would be a 230-kV overhead transmission line. The line to connect with the Crystal Substation could be built at either 230/500 or 500kV.

Two options for constructing, these two new gen-tie lines are being considered:

- **Option 1:** Where the two lines are parallel to one another, they would be separate lines - one 230kV and one 500kV - with a combined ROW width of 400 feet and then would split into a 150-foot ROW for the 230 line and a 250-foot ROW for the 500kV line or

- **Option 2:** Where the two lines are parallel to one another, the lines would be both built at 230kV on double-circuit 230kV structures with a 150-foot ROW width for most of its length, after the two lines split, a 230/500 step-up station would be built within the gen-tie ROW near the Crystal Substation, and a short section of 500kV line would run from the step-up substation to deliver the power to Crystal at 500kV.

Under either option, the new 230kV gen-tie line would connect with the approved gen-tie line between the Arrow Canyon Solar Project and the Harry Allen Substation (N-88870) and would also utilize the same existing access road to access the gen-tie ROW on BLM-managed lands.

This Plan of Development (POD) has been prepared for the Las Vegas Field Office of the BLM to identify the proposed location, construction activities, access, and other features of the portion of the gen-tie lines located on lands managed by BLM.

Applicant's Interests and Objectives for the Project

The proposed gen-tie lines would deliver renewable energy from the Chuckwalla Solar Projects to the regional electric grid via its interconnections to the Harry Allen and Crystal Substations. The Project would help Nevada and surrounding states meet their renewable energy goals and be consistent with BLM goals to facilitate the development of renewable energy.

Proposed ROW Location

Figure 1-2 shows and overview of the Chuckwalla Solar Project and **Figure 1-3** shows the location of the proposed routes for the Chuckwalla gen-tie lines on BLM-managed land where the proposed permanent right-of-way (ROW) for the gen-tie lines would vary between 150 to 400 feet wide as described above. The requested term of the ROW for all Project features is 50 years and the Project would operate year-round.

On BLM-managed lands, the proposed route options were developed to follow existing transmission line ROWs to the extent possible and take advantage of / utilize existing access roads to minimize impacts. See below for brief descriptions of the primary segments of the proposed routes for the two new gen-tie lines on BLM-managed land:

- Segments within the Designated Utility Corridor on the Reservation - approximately three miles west of I-15, the two lines would enter the designated utility corridor where it would go south-southwest for approximately 3.3 miles paralleling existing transmission lines. At that point, the line to Harry Allen would turn west for about 1.2 miles then exiting the corridor (continuing on tribal lands to the vicinity of the proposed substation on the Arrow Canyon Solar site). The line interconnecting to the Crystal Substation would utilize the same route to a point within the designated utility corridor north of the Crystal Substation and from there would extend south within the utility corridor on the Reservation for about 0.1 miles.

- Segment to Crystal off the Reservation – The proposed line to Crystal would continue south after leaving the Reservation for up to 0.7 miles on federal land managed by the BLM until it would enter the existing Crystal Substation.

Under both options, a ROW would be needed for connection with, access to, and maintenance of the approved line between the Arrow Canyon Solar Project and the Harry Allen Substation (N- 88870) - also on BLM-managed federal lands.. After reaching the vicinity of the proposed Arrow Canyon site substation, the 230kV line would connect to the already-approved 230kV line between Arrow Canyon and Harry Allen, which crosses 5.8 miles of federal land managed by the BLM. The area authorized under this grant is 15-150 feet wide, 76,137 feet in length, and contains 138.18 acres. Under both gen-tie options, the Projects request a ROW for connection with, access to, and maintenance of this approved gen-tie line.

The ROW for the proposed new 230kV gen-tie line that would connect to Harry Allen would be on BLM-managed lands within the designated corridor on the Reservation and would total about 4.5 miles. The ROW for the proposed route to the Crystal Substation would also be on BLM-managed lands both within the designated corridor on the Reservation (for about 3.9 miles) and on federal lands managed by the BLM (for about 0.7 miles). The ROW width would be 400 feet where the two lines would be adjacent to each other for Option 1 and 150 feet where the two lines would be double-circuit structures in Option 2. Access to the proposed ROW on BLM managed land would require the use of the existing road near the

Crystal Substation (same for both options). A new road would be built within the new gen-tie ROW for most of its length to access structure locations for construction and operation. In addition, short spur roads would be built to access each structure location in areas where the two lines are parallel to one another.

Table 1-1a and **1-1b** show the acreage of permanent and temporary ROWs for both options. The legal descriptions for both options are included in **Appendix A.**

All permanent Project disturbance including spur roads would be located within the proposed ROW of each line. Temporary disturbance requiring a short-term right-of-way (STR) would occur at some locations outside the ROW to accommodate pulling and tensioning sites and equipment laydown areas. The temporary areas needed during construction for equipment storage and material lay-down would be within or adjacent to the proposed ROW.

Temporary ROWS

Short-term ROW grants are often referred to as "temporary". The proposed Project would require temporary ROWs outside the permanent ROWs for the features described below:

- Segments within the Designated Utility Corridor on the Reservation – work areas and stringing sites containing 11.5 acres (Option 2) to 15.5 acres (Option1)
- Segment to Crystal off the Reservation – work areas and stringing sites containing about 5.8 acres (Option 1) to 6.0 acres (Option 2)

Maps of these route options (Option 1 and Option 2) are included in **Section 6**.

Table 1-1a
OPTION 1
(Parallel 230 and 500 kV Lines)
Dimensions of Project ROWs on BLM Jurisdiction

Feature		Length (ft)		Width (ft)		Acreage	
		Reservation Corridor	BLM	Reservation Corridor	BLM	Reservation Corridor	BLM
Gen-Tie Line ROWs[1]	Parallel 230/500	15,635	-	400	-	142.66	-
	230 Line	6,957	-	150	-	24.36	-
	500 Line	4,916	3,962	250	250	28.21	22.85
Existing Access Road ROW		1,127	5,581	24	24	0.62	3.08
Existing Arrow Canyon to Harry Allen 230 line ROW (N-88870)	230 Line	-	76,137	-	15-150	-	138.18
Temporary Use Areas Outside the ROWs	Gen-Tie Pull Sites	-	-	-	-	16.61	5.79

Table 1-1b OPTION 2 (Double-circuit 230 kV Line splitting to Separate 230 and 500 kV Lines) Dimensions of ROWs for Project Features on BLM Jurisdiction							
Feature		**Length (ft)**		**Width (ft)**		**Acreage**	
		Reservation Corridor	**BLM**	**Reservation Corridor**	**BLM**	**Reservation Corridor**	**BLM**
Gen-Tie Line ROWs[1]	Double-circuit 230	14,978	-	150	-	51.61	-
	Parallel 230/500	653	-	150-400	-	2.82	-
	230 Line	11,018	-	150	-	35.57	-
	500 Line	1,083	4,128	200	200	4.97	18.59
Step-up Substation (within gen-tie ROW)		340	-	190	-	1.50	-
Existing Access Road ROW		1,127	5,581	24	24	0.62	3.08
Existing Arrow Canyon to Harry Allen 230 Line ROW (N-88870)	230 Line	-	76,137	-	15-150	-	138.18
Temporary Use Areas Outside the ROWs	Gen-Tie Pull Sites	-	-	-	-	18.28	7.39

General Facility Description, Design, and Operation

The major components of the Project include transmission line facilities, step-up substation facilities, and communications facilities. Typical design characteristics for the Project are listed in **Table 1-2** with more detail on Project design in the following sections. Final design characteristics will be determined in the detailed design phase of the Project prior to construction.

Transmission Line

The proposed gen-tie lines would be built as two single-circuit lines (Option 1) or as a double-circuit line (Option 2) in the segments where they parallel one another. They would use H-frame or single steel pole structures that would be made of self–weathering or galvanized steel. Illustrations of the typical steel pole and H-frame structures that could be used for this Project are provided in **Figures 1-4** and **1-5.**

Structure heights would be up to 160 feet varying with terrain and associated span lengths. The average span length is expected to be approximately up to 1,500 feet, resulting in about 4 to 5 structures per mile of line.

Table 1-2 PROJECT DESIGN CHARACTERISTICS PORTION OF GEN-TIE LINES MANAGED BY BLM	
Transmission Line Facilities	
Line length	Line to Harry Allen - approximately 4.4 miles of new line to Arrow Canyon, connecting with the approved Arrow Canyon gen-tie line (N-88870). Line to Crystal – approximately 4.6 miles
Type of Structure	Single or double-circuit, single steel pole for 230kV line, H-frame for 500kV
Structure height	up to 160 feet
Span length	up to 1,500 ft
Number of structures per mile	Approximately 4 to 5
Right-of-way width	150-400 feet on BLM
Access roads	Short spurs from existing access roads where adjacent, within ROW where no existing access
Voltage	230 and 500 kV
Circuit configuration	Single or double-circuit (three phases per circuit)
Conductor size	Two or three 1.5 to 2-inch ACSR conductors per phase
Minimum ground clearance of conductor	30 to 35 feet at expected operating temperature
Pole foundation depth/diameter H-frame tower foundation depth / diameter	15 to 30 feet / 6 to 12 feet 15 to 20 feet / 4 to 8 feet
Substation Facilities	
Possible 230/500kV Step-up Substation	Approximately 1.5 acres
Existing Harry Allen Substation	No disturbance outside footprint
Existing Crystal Substation	No disturbance outside footprint
Communications Facilities	
Systems	Digital Radio System, microwave, very high frequency (VHF)/ ultra-high frequency (UHF) radio, T1 service lines, and fiber line / OPGW
Functions	Communications for fault detection, line protection, Supervisory control and data acquisition (SCADA), and two-way voice communication.

Each pole would be installed on drilled piers with anchor bolts which would be typically 15 feet to 30 feet deep and 6 feet to 12 feet in diameter. Each H-frame structure would require two cast-in-place drilled pier foundations each ranging from 15 feet to 20 feet deep and 4 feet to 8 feet in diameter. The tower footings would be installed by placing reinforced steel and a tower stub angle into the foundation hole, positioning the stub and encasing the stub in concrete. The foundation depths and diameters would depend on prevailing soil properties. A geotechnical study would be conducted prior to final foundation designs.

Each circuit would have two or three conductor bundles per phase. Each conductor would be a 1.5 to 2-inch diameter ACSR conductor. The transmission line would also have two shield wires mounted on the top of the structures. One or both of them would be composed of extra high strength steel wire. It is possible that one of the shield wires could include an optical ground wire (OPGW) constructed of

aluminum and steel which would carry glass fibers within its core. This fiber cable would provide communications for the Projects between the two substations. If fiber is not included in the shield wire, a separate fiber cable, or dual cables would be strung on the structures below the conductors to provide the needed communications link.

Related Infrastructure

Access Roads

On BLM-managed lands, the Chuckwalla gen-tie lines were designed to provide the smallest possible ground disturbance footprint and to follow/utilize existing roads where possible. Access to the proposed ROW on BLM managed land would be provided by the existing road near the Crystal Substation. This existing access road is the only road outside of the proposed ROW for the gen-ties and would also require coverage under the ROW grant. No improvements are needed to this road.

The planned access to the various segments of the proposed gen-tie lines on BLM-managed lands is described below:

- Segment within the Designated Utility Corridor on the Reservation - The entire portion of the line within the designated utility corridor would require a new road within the transmission line ROW (for both Options 1 and 2). Where the two lines would be adjacent in Option 1, short spur roads would be built from this new road to each structure location on the second line.
- Segment to Crystal on Federal Land –This segment would require a new road built within the transmission line ROW from which short spur roads would be built to each structure location

New roads would be approximately 20 feet wide and unsurfaced and would be located within the ROW for the transmission line. Because of the flat topography, it is currently expected that only minor drainage improvements could be needed along these new roads within the ROW. Prior to construction, the location of all drainage ditches, culverts, swales, water bars, dips and low-water crossings that could be needed would be identified in the final POD based on the final project design.

Where the two lines are paralleling one another, spur roads would be constructed from the new road and to access work areas for the new gen-tie transmission structures associated with the second line.

Substations

The proposed Chuckwalla gen-tie lines would interconnect the Chuckwalla Solar Projects to the existing Crystal Substation and Harry Allen Substation – both located on BLM-managed federal land.

The project could also include construction of a new step-up substation on BLM-managed land as part of the Project. The line to the Crystal Substation would be built at either 230 or 500kV. If this line is built at 230kV, a 230/500kV step-up substation would be built on BLM-managed lands within the designated corridor on the Reservation near the Crystal Substation to deliver the power at 500kV. This station would be located with the proposed gen-tie ROW and would be approximately 190 feet by 340 feet and impact approximately 1.5 acres.

Communication Facilities

The proposed project would include communications facilities needed for fault detection, line protection, supervisory control and data acquisition (SCADA), and two-way communication. This would include facilities located within the fence of the two substations, a T1 service line, and a redundant communication line between the two substations that that would be mounted on the transmission structures.

One of the shield wires at the top of each structure could include an optical ground wire (OPGW) constructed of aluminum and steel core which would carry glass fibers within its core. If fiber is not included in the shield wire, a separate fiber cable or dual fiber cables would be strung on the structures below the conductors to provide the needed communications link.

Other Federal, State, and Local Agency Involvement

The proposed route for the Chuckwalla gen-ties would cross tribal lands, Reservation lands within a designated utility corridor, and public land administered by the BLM. Federal, state, and local agencies and tribes would be consulted during the National Environmental Policy Act (NEPA) analysis of the Project which will be led by the Bureau of Indian Affairs (BIA) as the lead agency. In addition to the BLM and BIA, those agencies with potential jurisdiction over this Project would be contacted to obtain necessary permits and approvals. These agencies are identified in **Table 1-3** (the state and local permits identified could be applicable for those portions of the gen-tie on federal lands managed by the BLM).

TABLE 1-3 GOVERNMENT AGENCIES / JURISDICTION		
Agency/Department	**Permit/Approval**	**Action**
Federal Agencies		
Bureau of Indian Affairs	ROW on tribal lands	Lead Federal agency for National Environmental Policy Act, Section 106 Consultation and Endangered Species Act (ESA) Consultation. ROW for tribal lands.
Bureau of Land Management	ROW with designated utility corridor on tribal land, ROW on federal lands	Act as cooperating agency on the NEPA document
U.S. Fish and Wildlife Service (USFWS)	Biological Assessment, Section 7 Consultation, Biological Opinion (ESA)	Potential effect on federally listed endangered/threatened/proposed species
Department of Defense	Consultation	Confirmation of no effect on military training airspace.
Advisory Council on Historic Preservation (ACHP)	Section 106 Consultation, National Historic Preservation Act (NHPA)	Opportunity to comment if Project may affect cultural resources listed or eligible for listing on National Register of Historic Places.
State Agencies		
Utilities Environmental Protection Act (UEPA) – Permit to Construct	Public Utilities Commission of Nevada	Required for greater than 70-MW renewable energy facility or a 200-kV transmission line.
Nevada Division of Environmental Protection (NDEP)	General Construction Activity Stormwater Permit	Stormwater discharges associated with construction activity for projects in hydrographic basins containing Waters of the U.S.
NDEP	Groundwater Discharge Permit	Needed if non-potable water is used for dust control during construction.
Nevada State Historic Preservation Office	Section 106 Consultation, NHPA	Consultation regarding activities potentially affecting cultural resources.
Nevada Department of Wildlife (NDOW)	NRS 701.600-701.640 Energy Review Program Participation	Cost recovery for NDOW consultation regarding wildlife impacts.
NDOW	Special Purpose Permit	Needed for handling tortoises.
Nevada Department of Transportation (NDOT)	Right-of-Way Occupancy Permit	Needed for I-15 highway crossing
Local Agencies		
Clark County	Special Use Permit	For non-conforming uses within County.
Clark County Department of Air Quality	Dust control permit	Dust control during construction.

2.0 CONSTRUCTION OF FACILITIES

This section describes the construction process and methods that would be employed to develop the Project. The construction and installation of the transmission line would generally be performed using the proposed construction techniques discussed in the following subsections. Any modifications to the proposed construction techniques that arise during construction on federal lands would be approved by a variance, as would be outlined in a Construction and Environmental Compliance Monitoring Plan.

Tables 2-1 and **2-2** show the acres of temporary and permanent impacts that would result from development of the Project for Options 1 and 2, respectively. The construction activities and areas of potential impact would be limited primarily to access roads, spur roads, structure locations, lay-down yards, and pull and tensioning sites.

Several standard mitigation and best management practices would be employed by the Applicant as part of the Project. A comprehensive list of these Applicant Design Features (ADFs) is included appended to this POD identifying those measures that would be applied to the Project by the Applicant to avoid or reduce resource impacts.

Some of the ADFs would be applied to specific areas where needed (where a specific type of resource exists). In these cases, the locations of these geographically specific measures would be shown on the detailed design drawings prepared prior to construction.

Table 2-1
CHUCKWALLA GEN-TIE LINE PROJECT
OPTION 1 – PARALLEL ROWs
PROPOSED PROJECT IMPACTS

Impact Type	Work Area Type	Jurisdiction		Total Acres
		Federal Land (Acres)	Tribal Land within Designated Corridor (Acres)	
Permanent Impacts				
	Structure Work Areas	0.7	5.2	5.9
	New Roads	1.3	10.0	11.3
	Spur Roads	0	1.1	1.1
Permanent Impacts Total		**2.0**	**16.3**	**18.3**
Temporary Impacts				
	Work/Laydown Areas	0.5	4.6	5.1
	Stringing Sites	6.9	28.3	35.2
Temporary Impacts Total		**7.4**	**32.9**	**40.3**

Table 2-2 CHUCKWALLA GEN-TIE LINE PROJECT OPTION 2 – DOUBLE-CIRCUIT LINE PROPOSED PROJECT IMPACTS				
Impact Type	**Work Area Type**	**Jurisdiction**		**Total Acres**
		Federal Land (Acres)	**Tribal Land within Designated Corridor (Acres)**	
Permanent Impacts				
	Structure Work Areas	0.7	3.2	3.9
	New Roads	2.5	10.0	12.5
	Spur Roads	0	0.2	0.2
Permanent Impacts Total		**3.2**	**13.4**	**16.6**
Temporary Impacts				
	Work / Laydown Areas	0.5	2.5	3.0
	Stringing Sites	6.9	19.7	26.6
Temporary Impacts Total		**7.4**	**22.2**	**29.6**

Pre-Construction Surveys and Standards

Environmental Pre-Construction Surveys

Environmental resource surveys would be conducted as part of the NEPA process for the Project. In addition, the final NEPA document would identify any additional pre-construction resource clearance surveys for biological and cultural resources that would be conducted prior to the start of construction. If resources are encountered during the pre-construction surveys or during construction, appropriate measures would be implemented at that time to minimize any potential impact.

Environmental resource surveys would be conducted by qualified resource specialists. Specifically, qualified biologists will evaluate the biological resources and sensitive species for analysis. The details of these surveys would be coordinated with the BLM, USFWS, and NDOW as needed. Further details regarding required pre-construction environmental surveys would be specified in the final NEPA document, ROW stipulations, and conditions in the Biological Opinion (BO).

Class III pedestrian surveys for cultural resources would be conducted by qualified resource specialists during the NEPA process and in accordance with a cultural resources plan. The survey area for this effort (Area of Potential Effect or APE) would include sufficient buffer to ensure all potentially disturbed areas are evaluated. Cultural plans would be developed that include monitoring and discovery processes identified in compliance with Section 106 of the NHPA.

Geotechnical Pre-Construction Surveys

A detailed geotechnical field survey would be conducted as part of design and engineering prior to construction. The purpose of the field geotechnical program will be to observe subsurface conditions and obtain samples of site soils for laboratory testing and classification with results from the analyses helping determine the foundation design for the transmission structures. Because this work will focus on the transmission structure locations, all associated disturbance would be located within the proposed ROW. It is anticipated that the geotechnical field survey for the proposed project would take place during development of the NEPA document and authorized through issuance of a Categorical Exclusion.

A detailed field plan for the geotechnical field program would be provided to BLM for approval prior to implementation. Borings would be obtained typically using a truck-mounted auger. No core drilling of rock would be required and the need for drilling fluids or water is not anticipated.

Drill crews would utilize the existing roads to access each boring site. Overland drive and crush techniques will be used where new access is needed. The need for grading at these locations is not anticipated. The boring holes would be backfilled with the cuttings.

The cultural and biological resources surveys conducted for the line would be used to ensure that potential impacts to cultural or biological resources are avoided for each boring location prior to any ground disturbing activities.

Construction Crew Training and Safety

Prior to construction, all contractors, subcontractors and Project personnel would undergo an agency-approved environmental training program to become familiarized with construction requirements in the POD, the ROW, and any Temporary Use Permits (TUPs). All contractors and company personnel would be required to attend this training prior to gaining access to the ROW. This training will familiarize participants with required environmental protection measures outlined in a Construction and Environmental Compliance Monitoring Plan that would be developed in consultation with BLM and other agencies.

Additionally, safety training would be mandatory for all Project personnel (e.g., supervisors, inspectors, surveyors, employees, construction engineers, contractors, contractor's employees, and subcontractors) prior to performing any work on-site. Team members would attend daily construction tailboards, detailing specific safety hazards for all work locations, acceptable Personal Protective Equipment (PPE), work location awareness and communication of unsafe work practices. All team members will be required to wear appropriate PPE while on-site. A detailed Health and Safety Plan developed and approved prior to construction will be kept on-site to be used during training.

Despite best efforts, accidents, acts of nature, and other emergency situations can occur. Effective preparations for emergency and response can reduce injuries, prevent or minimize environmental impacts, protect employees and the community, reduce asset losses, and minimize downtime. A detailed Emergency Preparedness and Response Plan would be developed and kept on site to address emergency protocols.

All applicable fire laws and regulations would be observed during construction and BLM fire safety standards would be followed. All personnel would be advised of their responsibilities under these

requirements, including taking practical measures to report and suppress fires. The Fire Prevention and Response Plan would be developed in consultation with BLM that provides the required detail on fire safety procedures.

Transmission Line Surveying, Flagging, and Staking

Prior to construction, pre-construction engineering survey work would be conducted locating the centerline, structure center hubs, ROW boundaries, and access roads. All these features would be staked in the field and no paint or permanent discoloring agents would be applied to rocks or vegetation to indicate survey or construction limits. After the Project components have been marked in the field, any required pre-construction environmental field surveys would be conducted as necessary. Prior to the initiation of any pre-construction surveys, the necessary survey permits for federal land and rights-of-entry to tribal land would be obtained.

Any sensitive resources within the planned work areas would be flagged so they can be avoided or appropriately dealt with during construction as described below.

Construction

The typical sequence of construction activities required for the completion of transmission line construction are described below.

Lay-down Yards

Construction of the transmission line would begin with the establishment of lay-down yards, which would be required for storing materials, construction equipment, vehicles and in some cases as a show-up yard for the construction crews. The gen-tie lines would likely have two lay-down yards – one at each end of the lines. These areas could each require approximately 5 to 10 acres and they would be located on tribal lands.

Vegetation would be cleared with possibly grading in these areas as needed. Unless otherwise directed, the lay-down yard would be restored following construction.

Access to and along the ROW (Permanent and Temporary)

Access to the portions of the proposed gen-tie ROWs under BLM management would be provided by an existing access road and no upgrades are expected to be required. This existing access road is located both within the designated utility corridor on the Reservation and federal lands managed by BLM south of the Reservation and is outside the proposed ROW.

Access to each new structure location would be provided by a new road within the proposed gen-tie ROW. Where the two lines would be built as two separate parallel lines (Option 1) the structure locations for the second line would be provided from short spur roads from the new access road. These new roads and spur roads would be up to approximately 20 feet wide. Roads would be constructed in accordance with BLM and/or other relevant standards. The proposed locations of these roads are shown in **Section 6** of this POD.

Because of the flat topography, it is currently expected that only minor drainage improvements could be needed along these new roads within the ROW. Prior to construction, the location of any drainage ditches, culverts, swales, water bars, dips and low-water crossings that could be needed would be identified in the final POD based on the final project design.

If affected, fences and gates may be built or replaced as required by the land manager or landowner. If cattleguards, fences, and gates are damaged, they would be repaired or replaced to their original condition as required. Temporary gates would be installed only with the permission of the land manager or landowner.

After Project construction, existing and new permanent access roads would be used by maintenance crews and vehicles for inspection and maintenance activities.

Structure Site Clearing, Foundation Excavation, and Foundation Installation

Structure sites would be located 1,000 to 1,600 feet apart. Where the line parallels the existing lines, the new structures would be located adjacent to the existing structure where possible to best utilize the terrain and existing access. Where the line deviates from the existing lines, structure locations would be determined by topography and best engineering practices. The locations of proposed structure sites on lands managed by BLM are shown in **Section 6.**

Vegetation clearing and ground disturbance would be required at each structure site for excavation of holes and pouring of concrete foundations. Each structure location would be cleared of vegetation, used for construction, and remain available for future line maintenance. Structure sites will only be graded if necessary. Each structure site would be approximately 125 feet by 60 feet in size resulting in approximately 1.0 acre of temporary disturbance per structure site. These sites would be smaller where needed if limited workspace is available.

Foundation excavations would be made using mechanized equipment, with tubular steel structures for a 230kV line requiring holes 6 to 12 feet in diameter. If a separate 500kV line is built using H-frame structures, each structure would require two holes 6 foot to 8 foot in diameter. Turning structures would generally be tubular steel structures requiring either one, 2 or 3 holes 6 to 12 feet in diameter. Structure foundation excavations would be made with power drilling equipment. A vehicle-mounted power auger or backhoe would be used to excavate the structure foundations. In rocky areas, the foundation holes would be excavated by drilling. Although not expected, in some instances blasting could be necessary because of the specific geologic conditions. Further details on blasting procedures and safeguards would be included in a Blasting Plan that would be provided prior to construction if needed. Foundation holes left open or unguarded would be covered to protect the public and wildlife. Additionally, any holes left open would be cleared by a monitor to ensure any trapped wildlife are removed before work resumes.

Foundations would be installed by placing reinforced steel and transmission structure steel components into each foundation hole, positioning the steel components, and encasing them in concrete. Excess spoil material would be used for fill where suitable and any remaining soil would be spread on the access road.

Water would be used for soil compaction and dust abatement at each structure site and along access roads, as needed. Water for footer construction and dust abatement would be obtained from local water sources and trucked to the construction area.

Structure Assembly and Erection

Structural steel components and associated hardware would be transported from the lay-down yards to each structure site by truck. Steel structure sections would be delivered to structure locations where they would be fastened together to form a complete structure and hoisted into place by a large crane. At each structure site, a work area of approximately 125 feet by 60 feet would be required for the structure foundation locations, structure assembly, and the necessary crane maneuvers. The work area would be cleared of vegetation only to the extent necessary. Concrete for use in constructing foundations would be dispensed from concrete mixer trucks. After line construction, all pads not needed for future maintenance would be restored to the greatest extent possible and revegetated where required.

Conductor Installation

After the structures are erected, insulators, hardware, and stringing sheaves would be delivered to each structure site. The structures would be rigged with insulator strings and stringing sheaves at each ground wire and conductor position.

For public protection during wire installation, guard structures could be erected where the line would cross roads, existing power lines, and other obstacles. Guard structures would consist of H-framed wood poles placed on either side of an obstacle. These structures would prevent ground wire, conductor, and equipment from falling on an obstacle, and would be removed following the completion of conductor installation in that area. Equipment for erecting guard structures would include augers, line trucks, pole trailers, and small cranes. Guard structures may not be required for small roads or other areas where suitable safety measures such as barriers, flagmen, or other traffic controls could be used.

Pilot lines would be pulled (strung) from structure to structure either using helicopters or pulling equipment and threaded through the stringing sheaves at each structure. Following pilot lines, stronger line with a greater diameter would be attached to conductors to pull them onto structures. This process would be repeated until the ground wire or conductor is pulled through all sheaves.

The shield wire (and/or OPGW) and conductors would be strung using powered pulling equipment at one end and powered braking or equipment tensioning at the other end of each conductor stringing segment. Sites for tensioning equipment and pulling equipment would be approximately 14,500 feet apart. Each pulling / tensioning site would be approximately 100 feet by 400 feet. There would be no blading at pull sites if the terrain is sufficiently level. Pull site locations will be confirmed during final design.

Helicopter Use

As stated above, helicopters could possibly be used to pull in pilot lines along the BLM-managed portion of the line as well as other parts of the line. If helicopters are determined to be necessary, it is anticipated that one of the lay-down yards on tribal lands would be used for helicopter staging if needed. More details regarding helicopter use would be included in a Helicopter Flight and Safety Plan developed prior to construction. The construction contractor would also develop a detailed helicopter plan specifically for each area where they would be proposed for use. A draft of the helicopter use plan is included in **Appendix B**.

Construction Workforce and Schedule

The Project would be constructed primarily by contract personnel with the Applicant responsible for Project administration and construction review. **T**he estimated number of temporary workers and types of equipment required to construct the proposed transmission lines are summarized in **Table 2-3**.

Construction of the proposed Project could include multiple construction crews working simultaneously at various locations. The typical work week would be approximately 10 hours per day, six days per week. If time constraints occur or a more aggressive production schedule is required, construction could start at two or more points concurrently.

The total length of time for the transmission line construction is estimated to be 9 to 12 months. A detailed transmission construction schedule would be developed that would include the breakdown of expected personnel and daily average run time per piece of construction equipment used for construction.

Water Use for Construction

The Project would use water for dust control and for assisting with large ground bores for concrete foundations during construction. For dust control in the Project's geographical location, dust control would require application of water spread out over the construction period. For boring foundations, some material conditions could require the addition of water to assist the auger. All disposal of water used for construction purposes will be per any local, state, and federal rules and regulations.

Water would be sourced and purchased from the Moapa Band and sourced from local wells. As an option, water could be obtained from other local providers if needed.

Industrial Waste and Toxic Substances

Petroleum products such as gasoline, diesel fuel, crankcase oil, lubricants, and cleaning solvents would be present within the Project ROW and temporary work areas during construction. These products would be used to fuel, lubricate, and clean vehicles and equipment, and would be transported in approved trucks or containers. When not in use, hazardous materials would be properly stored to prevent drainage or accidents. A Hazardous Waste Management and Spill Prevention Plan would be developed for the Project and ultimately the construction contractor will provide the final Plan to BLM for approval prior to construction.

All construction waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials, would be removed to a disposal facility authorized to accept such materials.

Post-Construction Rehabilitation

This section outlines the actions that would be employed immediately following the completion of construction to ensure Project stabilization and rehabilitation.

Transmission Line Reclamation

Reclamation treatments would be applied to construction-related disturbances to rehabilitate temporary

use areas. Reclamation treatments will be included in a Reclamation Plan that would be submitted for approval prior to construction. This plan could focus on restoring plant communities and associated wildlife habitat, preventing substantial increases in noxious weeds in the Project area, minimizing Project-related soil erosion, and reducing visual impacts caused by construction activities.

Noxious Weed Management

A Noxious Weed Management Plan would be developed prior to construction that would outline the measures to control noxious weed species during transmission line construction, operation and maintenance as well as reclamation and revegetation of the disturbed areas. Surveys would be conducted in areas disturbed during construction within the construction corridor, and along access roads.

Erosion Control

A Surface Water Protection Plan would be developed prior to construction, identifying site-specific erosion control measures that would be implemented to prevent erosion and runoff during and immediately following construction.

TABLE 2-3
ESTIMATED PERSONNEL AND EQUIPMENT FOR TRANSMISSION LINE CONSTRUCTION

Activity	Equipment Type	Pieces of Equipment	# of People
Material/Yard / Receiving / Distribution (two yards)	3/4-ton Pickup	4	8
	10,000 R/T Forklift	2	
	50-ton Crane	2	
	Tractor Trailer (flatbed)	3	
	20-ton Boom Truck	2	
	100-ton Crane	0	
Survey (Construction Staking)	1/2-ton Pickup	2	4
	ATVs	4	
Soil Borings	3/4-ton Pickup	2	6
	Drill Rig	2	
ROW Clearing	3/4-ton Pickup	4	4
	Chainsaw	4	
	Hydro Axe	1	
Roads and Access	1-ton Pickup	2	6
	Cat D-6	1	
	Grader	1	
	Semi w/Dump Trailer	1	
	Water Truck	3	
Foundations	1/2-ton Pickup	3	20
	1-ton Pickup	3	
	Drill Rig	3	
	Loader/Backhoe	3	
	Boom Truck	3	
	Concrete Truck	3	
	Generator	3	
	Cat D-6	3	

TABLE 2-3 ESTIMATED PERSONNEL AND EQUIPMENT FOR TRANSMISSION LINE CONSTRUCTION			
Activity	**Equipment Type**	**Pieces of Equipment**	**# of People**
Structure Assembly H-frame	1/2-ton Pickup	3	16
	1-ton Line Truck	3	
	40-ton Boom Truck	3	
	Air Compressor	3	
	30-ton R/T Crane	3	
Structure Assembly Tubular	1/2-ton Pickup	1	8
	1-ton Flatbed Truck	1	
	Air Compressor	1	
	50-ton R/T Crane	1	
Structure Erection (H-frame)	1/2-ton Pickup	1	10
	1-ton Flatbed Truck	1	
	200-ton Crane	2	
	150ft Bucket/Boom Truck	2	
	Air Compressor	1	
Structure Erection (Tubular)	1/2-ton Pickup	1	10
	1-ton Flatbed Truck	1	
	200-ton Crane	1	
	150ft Bucket/Boom Truck	1	
	Air Compressor	2	
Wire Pulling (Conductor, Overhead Ground Wire, OPGW)	1-ton Line Truck	2	20
	200-ton Crane	2	
	150ft Bucket/Boom Truck	2	
	Air Compressor	1	
	Cat D-8	3	
	Puller	2	
	Tensioner	2	
	Reel Trailer	2	
Conductor Clipping and Dead ending	1/2-ton Pickup	4	32
	1-ton Line Truck	6	
	Bucket Truck/ Boom w/Basket	4	
Restoration	1/2-ton Pickup	2	4
	Tractor with Disc	1	
	Cat D-4	1	
	Hydro Seed Truck	1	
Contractor Management /Compliance Monitors	1/2-ton Pickup	10	15
	ATV (Inspection)	2	

3.0 OPERATIONS, MAINTENANCE, AND DECOMMISSIONING

Operations

This section outlines those procedures that would be employed during the operation and maintenance phase of the Project after construction and post-construction restoration has been completed.

Operation and maintenance activities would include all requirements set forth by the Western Energy Coordinating Council (WECC) including activities such as patrol of the lines, climbing inspections, transmission structure (tower or pole) and wire maintenance and repair, routine insulator washing, and repairs of access and spur roads.

The Applicant would keep necessary work areas around all structures clear of vegetation. Also, the height of vegetation along the ROW would be limited so as not to interfere with operation of the line but the need for this is expected to be limited in this environment. The following sections provide details on the anticipated operation and maintenance requirements for the Project.

Transmission Line Safety

The safety measures implemented during construction for worker protection would be applicable during operation and maintenance and would be detailed in the Health and Safety Plan developed for the Project. The transmission line would be protected with power circuit breakers and related line relay protection equipment. Lightning protection would be provided by overhead ground wires (shield wires or OPGW) along the line. Electrical equipment and fencing at the substation would be grounded. All existing fences, metal gates, pipelines, etc. that cross or are within the transmission line ROW would be grounded to prevent electrical shock.

Transmission Line Emergency Response

Emergencies are any event requiring immediate response to a condition by Project personnel. These may include but are not limited to downed transmission line, structures, or equipment failure; fires and explosions; transformer outages and/or outages due to down wire. Responding crews would vary in number and equipment needs depending on the size and severity of the emergency. In areas without vehicle access, helicopters may be used to respond quickly to emergencies. A detailed Emergency Preparedness and Response Plan outlining the proposed measures would be developed and submitted for approval prior to the beginning of line operations.

Transmission Line Maintenance

Inspection Patrols and Maintenance Schedule

Regular inspections would be performed in accordance with the regulatory requirements for transmission facility maintenance. The Project's overhead transmission lines, transmission structures and substations would be inspected for corrosion, equipment misalignment, loose fittings, and other mechanical problems.

Normal maintenance or repairs to conductor or insulator components would not require notification to the BLM unless new ground disturbance is required. Access for this routine repair work would be confined to roads and access designated for this purpose.

In emergencies arising from fire, flood, storms, vandalism or other factors causing or requiring an outage, repair work would be conducted as soon as the damage is detected. Restoration procedures following completion of repair work would be similar to those prescribed for original construction.

Insulator Washing

If dirt and dust build up on insulators, it can compromise their insulating capabilities. In desert environments where rain is rare, washing the insulators can be conducted if necessary. Insulator washing involves driving a water truck to within six feet of a tower base and using a high-pressure hose to spray deionized water at the insulators. Insulator washing would not be expected more than twice a year and would be done with plain water.

ROW Maintenance

ROW maintenance would include grading or repair of spur roads and work areas and spot repair of areas subject to flooding if it causes erosion damage. Required equipment could include a motor grader, backhoe, four-wheel drive pickup truck, and a loader. All access roads would be maintained on a regular schedule.

Vegetation Management

A cleared area a minimum of ten feet around the base or foundation of all transmission structures would be maintained. In addition, work areas adjacent to access roads and electric transmission structures would be maintained for vehicle and equipment access necessary for operations, maintenance and repair. Shrubs and other obstructions would be removed as needed near structures to facilitate safe inspection and maintenance of equipment and to ensure system reliability. In addition, though not expected to be an issue for this Project, vegetation with a mature height of 15 feet or taller would not be allowed to grow within the ROW to protect system reliability and public safety.

Fire Control

All applicable fire laws and regulations would be observed during the operation and maintenance period. BLM fire safety standards would be followed and requirements for fire tool availability, spark arresters/mufflers on equipment, and coordination of extreme fire conditions with BLM representatives would be coordinated. When extreme fire conditions occur, BLM representatives would be contacted, and access would be limited, if needed.

Prior to construction, a Fire Prevention and Response Plan will be developed in conjunction with BLM that outlines all required fire safety and management measures needed for both construction and operation. All personnel would be advised of their responsibilities under these requirements, including taking practical measures to report and suppress fires.

Noxious Weed Control

The measures outlined in the Noxious Weed Management Plan would be continued on federal lands as dictated by BLM for long-term invasive weed abatement during operation. On private property, implementation of the plan could include specific weed abatement methods, practices and treatment timing as developed in consultation with the landowners and other parties.

Raven Control Plan

Prior to the completion of construction, a Raven Monitoring, Management and Control Plan would be prepared for portions of the Project route where needed. This plan would include the use of raven perching and nesting deterrents and describe the procedures for obtaining a permit from the appropriate agencies to legally remove ravens. The Project would obtain approval for this plan from the BLM and USFWS.

Decommissioning

This section outlines the measures that would be implemented in the future when the ROW permit expires and the Project is terminated. A Decommissioning Plan would be developed and finalized before decommissioning activities would start. At this time, these activities are anticipated to include:

- Removal of structures
- Recontouring of roads, tower pads, etc. if needed
- Stabilization and re-vegetation of disturbed areas

Structures would be removed and structure sites would be cleared and graded only to the extent necessary.

In general, all decommissioning and subsequent maintenance activities would be conducted in a manner that would minimize disturbance to soil and vegetation. Methods of restoration when the Project is terminated would adhere to the generally accepted standard operating procedures at the time. In addition, restoration would be implemented to achieve results that will reuse/recycles materials to the maximum extent practicable.

Prior to restoration, any necessary surveys would be conducted in accordance with accepted standards and procedures at the time. During any necessary restoration activities, education similar to that given to construction crews would be given to workers regarding environmentally sensitive areas and resources. In addition, environmental monitors would be utilized at any areas deemed necessary.

Standard safety procedures associated with restoration activities would be implemented. If any special construction techniques are needed for restoration, safety procedures would be outlined and implemented prior to beginning restoration activities.

4.0 RESOURCE CONSIDERATIONS

Description of Site Characteristics / Potential Environmental Issues

Special or Sensitive Species and Habitats

The Chuckwalla gen-tie lines are located within potentially suitable habitat for the federally threatened desert tortoise (*Gopherus agassizii*). Construction and operation of the gen-tie lines could potentially impact individual desert tortoises.

Special Land Use Designations

There are no special land use designations on the lands that would be crossed or directly affected by the Project or in the immediate vicinity. There are no wilderness or wilderness study areas nor wild and scenic rivers in the area.

Visual Resource Management (VRM) Designations

Visual resource management classes are categories assigned to BLM-managed lands that portray the relative value of the visual resources and the associated visual management objectives. One of four VRM classes, (I, II, III, IV) is assigned to an area. VRM Class I areas have the most valuable visual resources and VRM Class IV areas have the least. The VRM classes guide future land management actions and subsequent site-specific implementation decisions. The federal lands affected by the Chuckwalla gen-tie lines are managed as VRM Class IV. The objective for Class IV is to provide for management activities that require major modifications of the existing character of the landscape and the level of change can be high. The current visual character of the project area within the designated corridor and on federal land is impacted by the numerous existing utility lines and substations. The primary potential viewers of the gen-ties would be people traveling on I-15.

Cultural and Historic Resource Sites and Values

Cultural resources are defined as buildings, sites, structures, or objects that have historical, architectural, archaeological, cultural, and/or scientific importance. Generally, prehistoric sites across the Great Basin and the greater American Southwest exhibit the presence of humans during the late Pleistocene 15,000 years ago. Around 1,500 years ago, the Ancestral Puebloan inhabitants of the greater southwest came into the vicinity.

A cultural resources records search would be conducted through the State Historic Preservation Officer's (SHPO's) Nevada Cultural Resource Information System (NVCRIS) to identify previous cultural resource projects and archaeological sites within the Project Area. A Class III Cultural Resources Inventory would be completed in consultation with the BLM and BIA to identify the cultural resources that occur within the Project's area of potential effect (APE). The APE would include sufficient buffer around the proposed ROW and temporary use areas to ensure all potentially disturbed areas are evaluated. As a result, the APE will be larger than the expected impacts expected to result from the Project.

The resulting information would be utilized by the BLM and BIA to determine project-specific measures necessary to reduce potential impacts to cultural resources. To the extent feasible, significant cultural resources would be avoided and, if they cannot be avoided, appropriate mitigation would be developed.

Native American Tribal Concerns

As the lead federal agency, the BIA would conduct government-to-government consultations with the Moapa Band of Paiutes and other Native American tribes in the region with traditional interests in the area. These contacts would inquire about potential concerns about the effects of the proposed Project on historic properties or areas of traditional or cultural importance.

Hydrology and Water Quality

There are several ephemeral washes that cross the proposed route for the Project. Generally, drainages in the project area on BLM-managed lands flow south into the Dry Lake Playa. Because they are not connected and they are ephemeral, these drainages would not be jurisdictional by the Corps of Engineers under section 404 of the Clean Water Act.

Vegetation, Invasive Plants / Noxious Weeds

General vegetation in the region consists mainly of Sonora-Mojave Creosote bush / White Bursage Desert Scrub. The BLM and the State of Nevada have protections for cactus and yucca species that would need to be evaluated on the BLM-managed federal lands.

The BLM and State also regulate and manage invasive plant species. The BLM would require development and implementation of a Restoration and Revegetation Plan and an Integrated Weed Management Plan on the lands managed by BLM to reduce potential impacts from invasive plants and noxious weed species.

Air Quality

Construction and operation of the Project would result in the generation of dust and tailpipe emissions from vehicle traffic. There would be an increase in dust emissions during construction activities that would be mitigated by the application of best management practices outlined within a Fugitive Dust Plan. On BLM-managed federal lands, this plan would be developed to satisfy Clark County requirements. Disturbed areas would be watered as necessary to suppress dust during construction and operation.

Recreation

The BLM-managed lands crossed by the Chuckwalla gen-ties are generally not used for recreation. Most of these lands are on the Reservation and not open to the public.

Socioeconomics

Socioeconomic impacts generated from the Project would be short-term and generally positive. The gen-tie lines would create some jobs for the local and regional population during construction. There would be short-term traffic impacts generated by the transportation of workers and equipment to the Project ROW during construction.

Location Relative to Existing Designated Utility Corridors

Most of the lands managed by BLM that would be crossed by these gen-tie lines are within federally designated utility corridors.

Project Design Features / Mitigation

As stated throughout this POD, the Applicant would develop and implement a variety of mitigation plans and conservation measures to minimize the environmental impacts from construction and operation of the Project. These plans are repeated below and would become part of the Final POD for the Project and will be reviewed and approved by the BLM prior to the initiation of construction:

- Dust Control Plan
- Emergency Response Plan
- Erosion and Sediment Control Plan / Surface Water Protection Plan (SWPP)
- Spill Prevention, Control, and Countermeasures (SPCC) Plan
- Health and Safety Plan
- Fire Prevention and Response Plan
- Vegetation Management Plan
- Site Restoration and Revegetation Plan
- Integrated Weed Management Plan
- Desert Tortoise Translocation Plan
- Cultural Resources Unanticipated Discovery Plan
- Traffic Control Plan
- Worker Environmental Awareness Plan (WEAP)
- Hazardous Materials Management Plan
- Decommissioning Plan

In addition, several standard mitigation and best management practices are proposed by the Applicant as part of the Project. A comprehensive list of these ADFs is included in **Table 4-1** below identifying those measures that would be applied to the Project by the Applicant to avoid or mitigate resource impacts.

Table 4-1

Applicant-Proposed Mitigation Measures

Soils

The Proposed Project could result in adverse impacts to soils as a result of increased erosion rates and reduction of soil productivity from removal of vegetation and grading activities. The Applicant would implement the following mitigation measures to reduce overall impacts to soil resources:

- Grading would be minimized to only those areas where necessary to meet the construction and operational requirements of the Project. Where no grading occurs, existing vegetation would be left in place and trimmed with drive and crush.
- Construction and operational activities will be conducted in compliance with a surface water protection plan (SWPP) that would include BMPs and other erosion-control measures designed to minimize soil erosion and limit sheet flow and downstream sedimentation. The SWPP would also incorporate adaptive management of actions if erosion and sedimentation control measures are found to be insufficient to control surface water at the site.
- To minimize wind erosion, all construction activities shall comply with the Fugitive Dust Control Plan that would be developed and implemented for the Proposed Project.
- Measures such as watering and 'stop work' periods during high winds would be incorporated into the plan.
- A Site Restoration and Revegetation Plan would be implemented to limit impacts to native, on-site vegetation as much as practicable. The Plan would define construction limits and BMP measures for soil restoration and revegetation and establish monitoring and success criteria.

Water Quality / Quantity

Potential adverse impacts to water are related to soil erosion and downstream sedimentation as well as water transport of hazardous material through soil erosion. As mentioned above, soil erosion would be managed via the SWPP and erosion controls within ephemeral washes to reduce velocity of flood flow and limit downstream sedimentation. The measures below would be implemented to reduce overall impacts to water quality:

- Grading would be minimized to only those areas where necessary to meet the construction and operational requirements of the Project.
- As part of the minimization of grading in the final design, ephemeral drainages would be spanned to the extent practical.
- The number of drainage crossings would be minimized to the extent possible and each would be designed to accommodate adequate flow.
- Adaptive management techniques will be implemented via the SWPP to maintain BMPs utilized to decrease sediment erosion and downstream transport of such during large rain events.
- Placing Project facilities in washes would be avoided by all alternatives to minimize direct and indirect impacts to the washes from erosion, migration of channels and local scour.
- A spill prevention counter-measure and control (SPCC) plan would be developed and implemented during construction of the Proposed Project.

Air Quality

The primary impact upon air would occur during the construction and decommissioning periods from increased vehicle emissions and fugitive dust. The following mitigation measures would be incorporated into construction contracts by the Proponent and would be implemented to reduce overall air impacts that would result from the Proposed Project:

- The area of grading and vegetation removal would be limited to only that area required for Project construction and operation.
- Vehicular speeds on non-paved roads would be limited 15 miles per hour.
- Water or palliative would be applied to disturbed areas to control dust and to maintain moisture level at optimum levels for compaction, as needed. Water will be applied using water trucks and application rates would be monitored to prevent runoff and ponding.
- Dust control measures such as watering and the application of palliatives approved by the USFWS would be applied to access roads and other Project roads to adequately control fugitive dust.
- Limit unnecessary idling and perform periodic and unscheduled inspections to ensure that construction equipment is properly maintained.

Biological Resources

The following measures will minimize, reduce, and mitigate impacts to biological resources from implementation of the Proposed Project:

- Measures identified in the Biological Opinion to mitigate potential effects to desert tortoise would be implemented.
- A Raven Control Plan will be prepared for the project to limit the impacts of common ravens and other avian scavengers on desert tortoise.
- A Weed Management Plan, which must be approved by the BLM and other agencies will be implemented prior to the initiation of ground disturbing activities.
- Preconstruction surveys will be conducted by qualified biologists according to the most current USFWS, BLM or Nevada Department of Wildlife (NDOW) protocols, where available, by species. These surveys would confirm the presence of special status plants, noxious weeds, and general and special status wildlife species, to help prevent direct loss of vegetation and wildlife and to prevent the spread of noxious plant species.
- Biological monitors will be assigned to the proposed project in areas of sensitive biological resources and along all roads used by Project personnel. Biological monitors would be in place along the access road during construction and/or temporary fencing utilized during the construction period to minimize any impacts from vehicles during construction. The monitors will be responsible for ensuring that impacts to special status species, native vegetation, wildlife habitat, or unique resources would be avoided to the fullest extent possible. Where appropriate, monitors will flag the boundaries of areas where activities would need to be restricted to protect native plants and wildlife or special status species. Those restricted areas will be monitored to ensure their protection during construction.
- The Applicant will monitor establishment and functionality of sediment control devices as outlined in the SWPP. Placement of these devices may need to be adjusted and placed further from roads to minimize risk to tortoises using them for shade. Ensure that BMPs are in place and working properly on a weekly basis.
- Any trenches or excavations should be covered if left overnight or have escape ramps to allow wildlife to safely exit.

- All work area boundaries will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers, equipment, vehicles, and construction materials shall remain within the ROW, existing roads, and designated areas. Staging areas will be located in previously-disturbed areas whenever possible. Crushing of perennial vegetation in work areas will be avoided to the maximum extent practicable.
- All transmission towers and poles will be designed to be avian-safe in accordance with the Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006 (Avian Power Line Interaction Committee [APLIC] 2006) and the Avian Power Line Interaction Committee (APLIC 2006) and Reducing Avian Collisions with Power Lines by the U.S. Fish and Wildlife Service and the APLIC (APLIC 2012).
- A Worker Environmental Awareness Program (WEAP) will be prepared. All on-site personnel will be required to participate in WEAP training prior to starting work on the Proposed Project. The WEAP training will include a review of the special status species and other sensitive resources that could exist in the Proposed Project, the locations of sensitive biological resources and their legal status and protections, and measures to be implemented for avoidance of these sensitive resources. A record of all trained personnel will be maintained.
- Construction vehicles and equipment will be cleaned of soil and plant material prior to entering and leaving the work site to minimize the introduction and spread of weeds.
- Measures to mitigate potential impacts to Gila monsters would be implemented.
- A Facility Decommissioning Plan would be developed and provided to the Tribe and BLM addressing the Project facilities under their respective management. This plan would be submitted for approval at least six months prior to commencement of site closure activities.

Cultural Resources

- Should any unrecorded and unanticipated cultural resources be discovered during construction, they would be addressed in accordance with an Unanticipated Discovery Plan. All activities within the immediate area of discovery shall cease. The BLM, Chairman of the Moapa Tribal Council, and the BIA Regional Archeologist shall be notified immediately and, consulting with SHPO as appropriate, they will make arrangements to assess the nature of discovered cultural resources and mitigate any effects resulting from the unanticipated discovery.

Transportation

The short-term impacts to traffic during construction would be reduced by implementing the following mitigation:

- A Traffic Management Plan would be finalized that identifies BMPs to minimize construction-related traffic impacts.
- Deliveries of materials would be scheduled for off-peak hours, when practical, to reduce effects during periods of peak traffic.

Public Health & Safety

In addition to the previously discussed SPCC Plan, the Applicant would implement the following measures to reduce significant impact to public health and safety:

- General Design and Construction Standards - The Project would be designed in accordance with federal and industrial standards including the American Society of Mechanical Engineers (ASME), National Electrical Safety Code (NESC), International Energy Conservation Code (IECC), International Building Code (IBC), Uniform Plumbing Code (UPC), Uniform Mechanical Code (UMC), the National Fire Protection Association (NFPA) standards, and OSHA regulations.

- Health and Safety Program - All employees and contractors would be required to adhere to appropriate health and safety plans and emergency response plans. All contractors would be required to maintain and carry health and safety materials including the material safety data sheets (MSDSs) of hazardous materials used on site.
- Emergency Response Plan - An Emergency Response Plan would be developed and implemented based on the results of a comprehensive facility hazard analysis.
- Hazardous Waste Management Plan - A Hazardous Waste Management Plan would describe the storage, transportation, and handling of wastes and emphasize the recycling of construction wastes where possible.
- The Project would coordinate with the holders of all existing ROWs that would be crossed or paralleled by the Project ROWs (transmission lines, access roads, water pipeline) to minimize encroachment conflicts and possible effects to existing transmission lines and pipelines.

5.0 COMMUNICATIONS

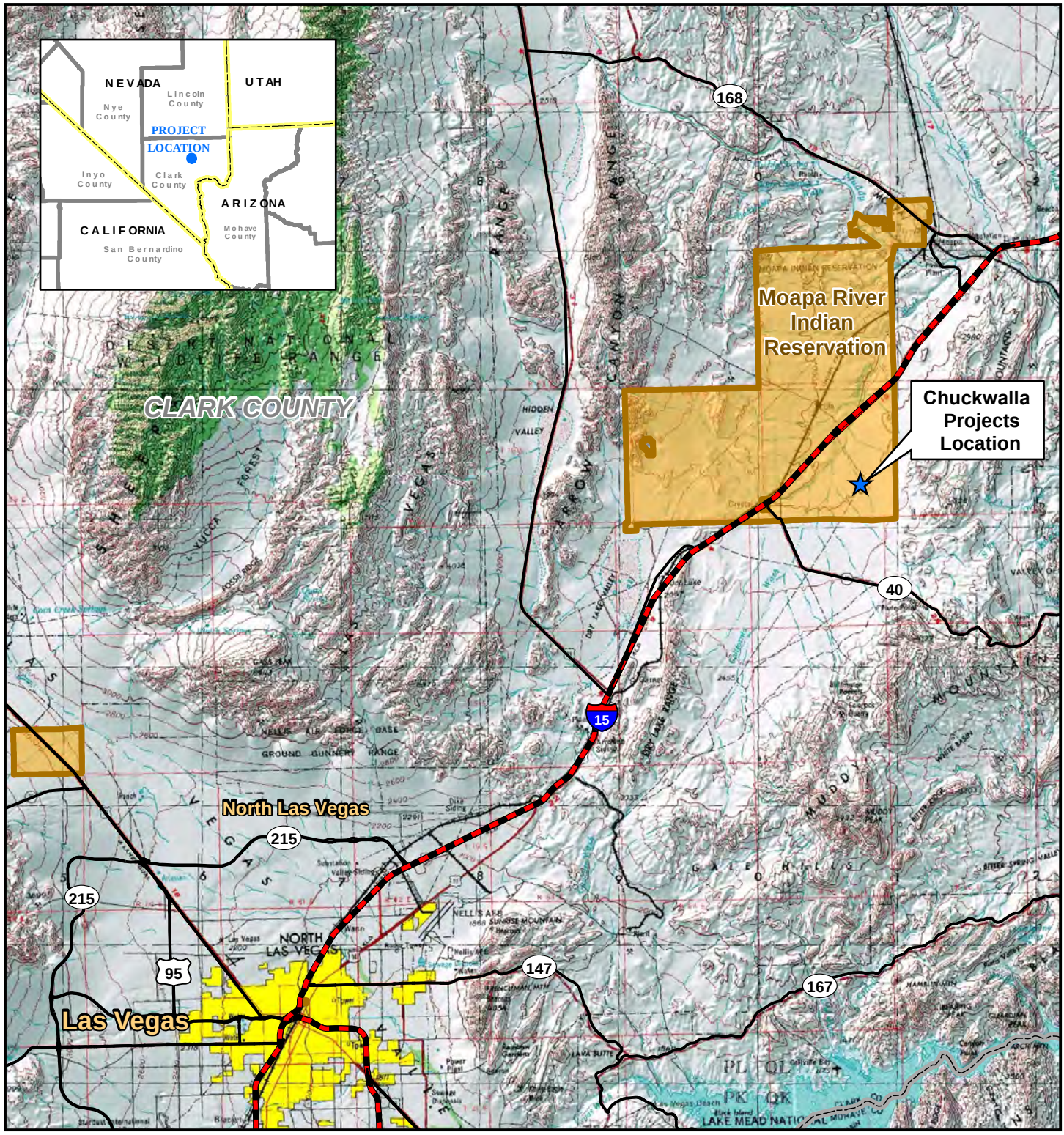
Roles and Responsibilities

A Field Contact Representative ("FCR") would be designated by the Project during construction and would be responsible for ensuring compliance with all mitigation measures, ADFs, and permit conditions. This would include all terms and conditions in permits or approvals from all federal, state, and local agencies.

Personnel from permitting agencies would periodically inspect the Project to verify compliance with or request information from the construction contractor regarding compliance with laws, regulations, and Project permits. The Applicant would be responsible for responding to requests from permitting agencies and submitting the permits and authorizations according to Project requirements. These roles and responsibilities would be described in detail in a Construction and Environmental Compliance Monitoring Plan developed and finalized prior to construction.

6.0 MAPS AND DRAWINGS

Attached are the POD figures and detailed route maps.



Legend

- Solar Project Location
- Interstate
- US/ State Highway
- Railroad

Jurisdictional Land Ownership

- Indian Reservation

0 2 4 6 8 10

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

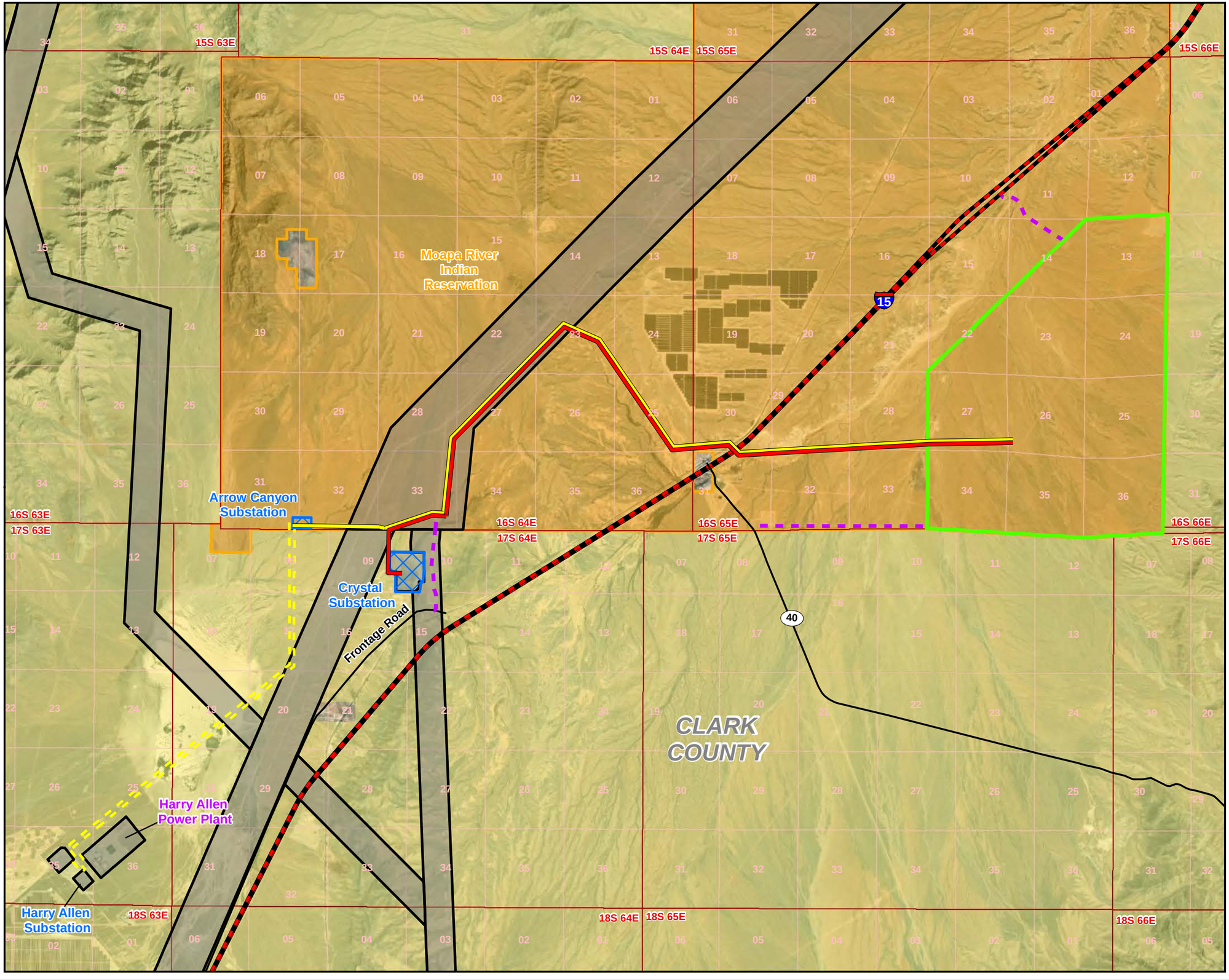
Chuckwalla Solar Projects

FIGURE 1-1
General Location

Map Extent: Clark County, Nevada

Date: 11-03-20		Author: rnc

G:\Chuckwalla Solar Project/MXD's/Project Location 8.5x11 110320.mxd



Legend

Project Components

- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Approved ROW Arrow Canyon - Harry Allen

General Features

- Interstate
- Major Highway
- Railroad
- Stream / River
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 0.5 1 1.5

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

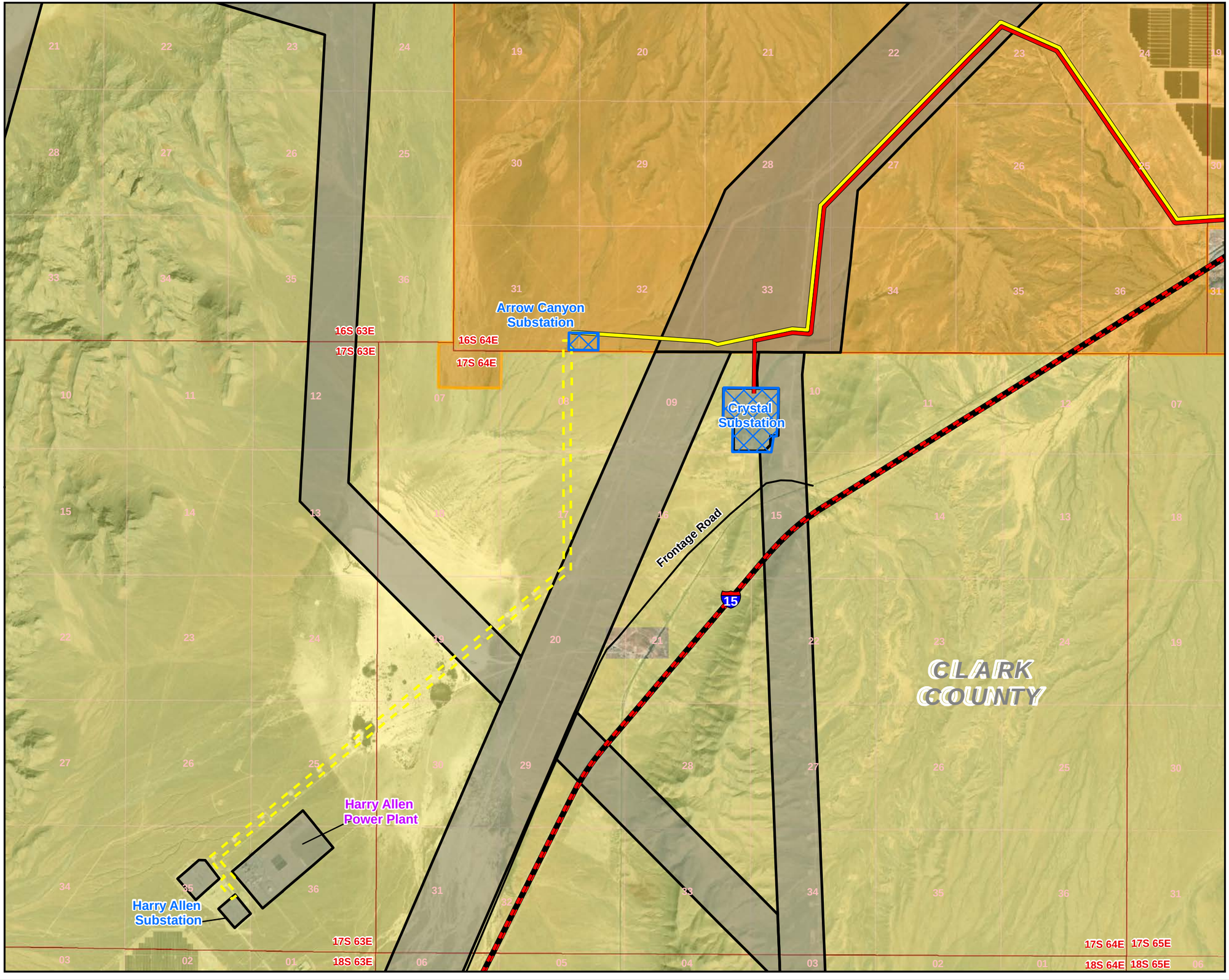
Chuckwalla Solar Projects

Figure 1-3
Project Overview Map

Map Extent: Clark County, Nevada

Date: 07-26-21		Author: rnc

G:\MXD's\Project Location_072621.mxd



Legend

Project Components

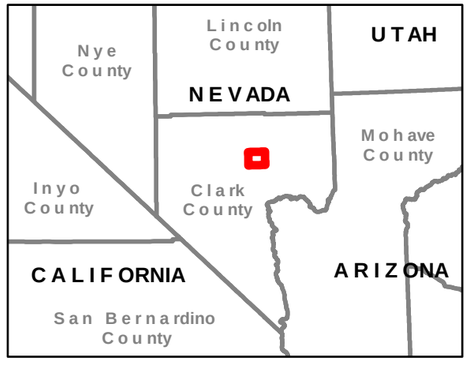
- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Approved ROW Arrow Canyon - Harry Allen

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land



0 0.5 1

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Gen-Tie

Figure 1-3
Overview Map - BLM Jurisdiction

Map Extent: Clark County, Nevada

Date: 02-16-21		Author: rnc

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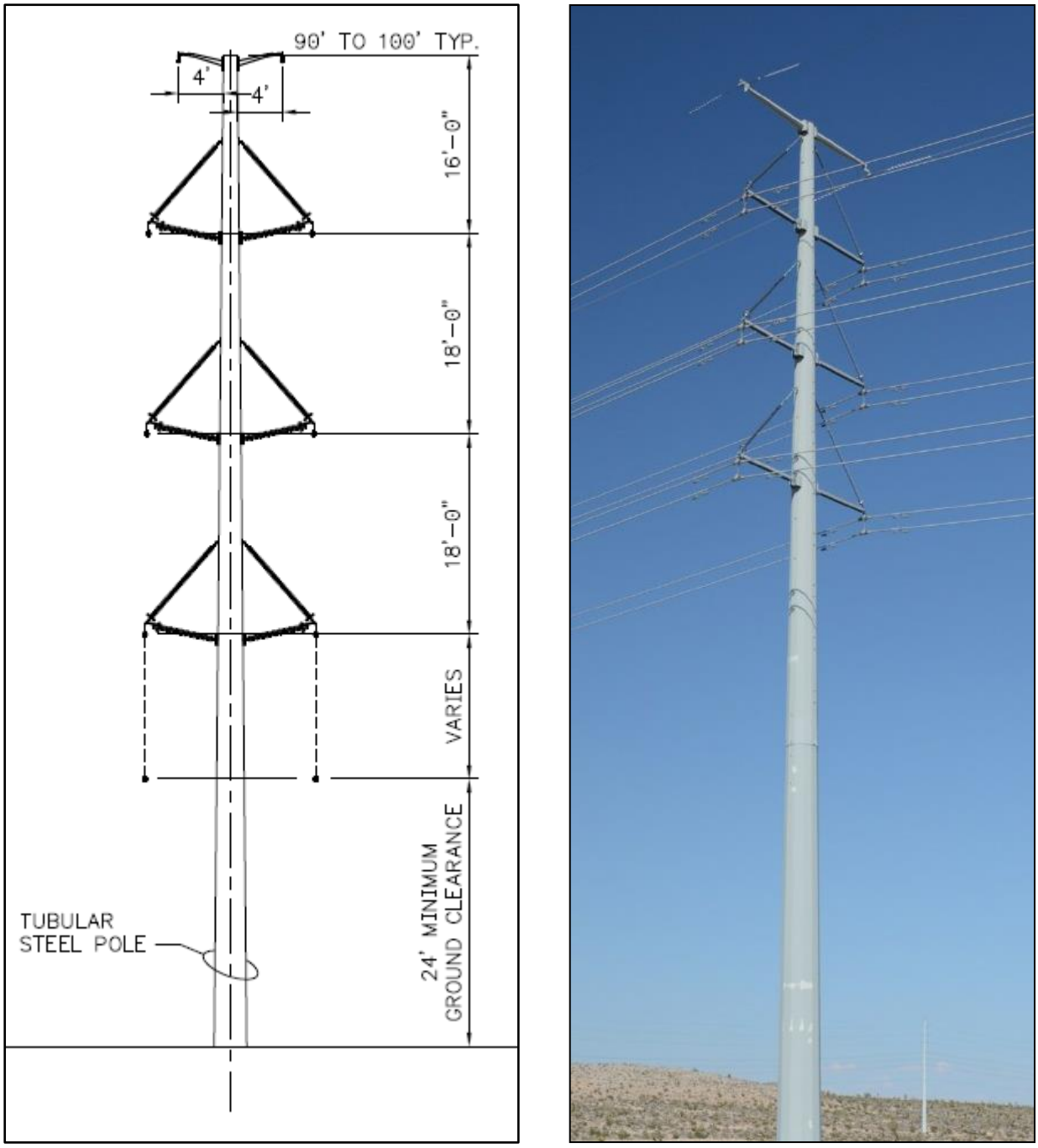


Figure 1-4
Typical Steel Pole Gen-Tie Transmission Structure

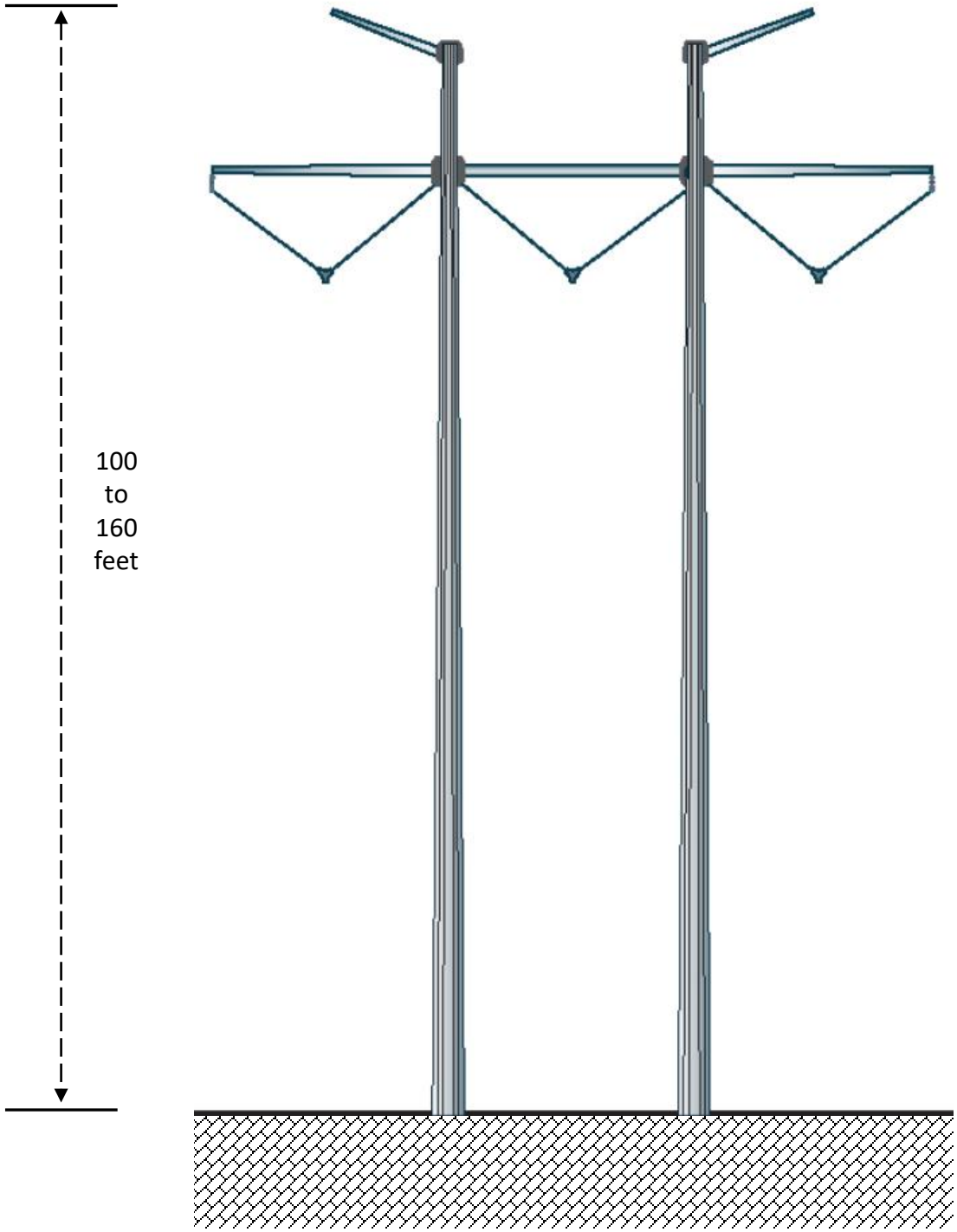
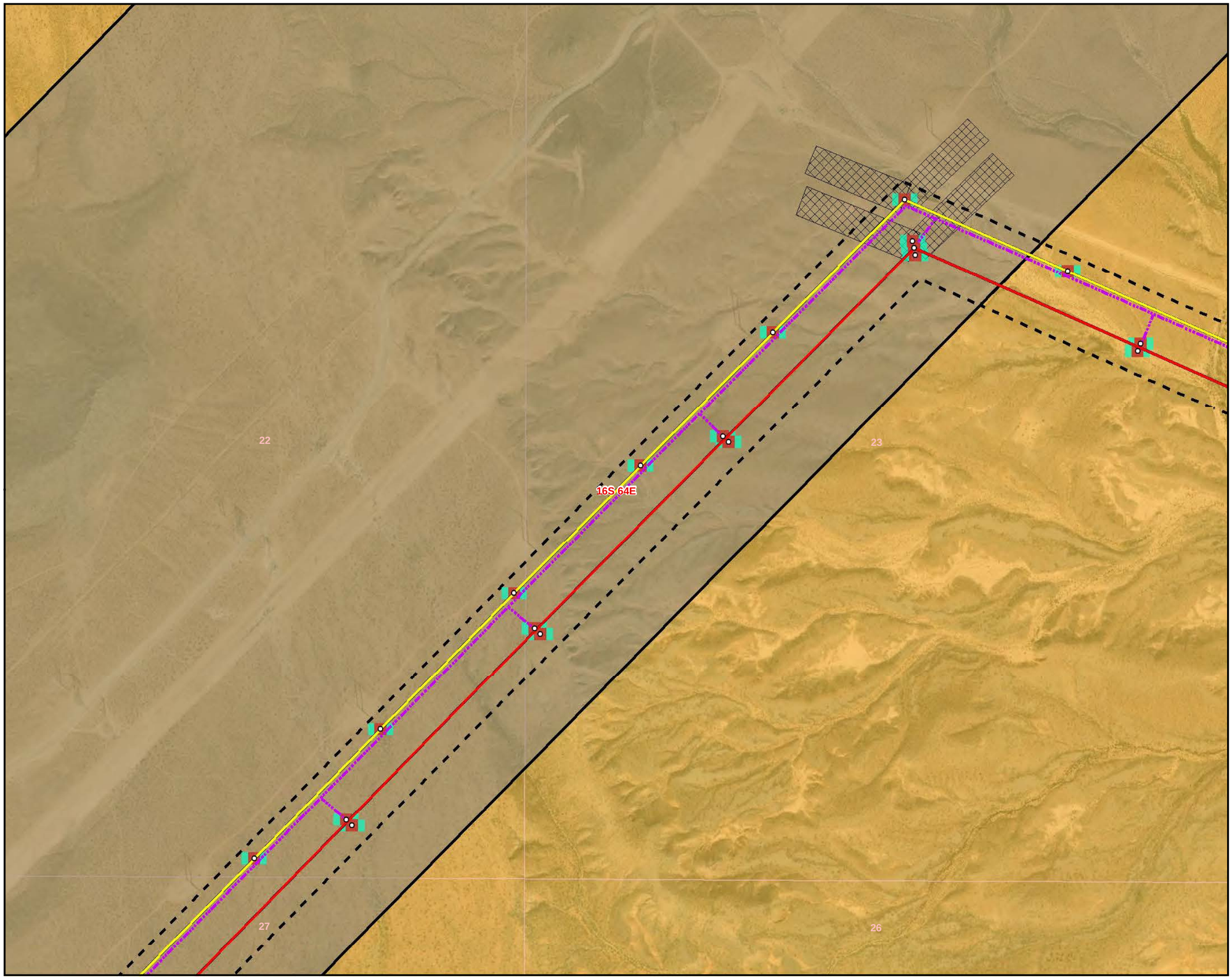


Figure 1-5
Typical 500kV H-Frame Structure

MAPBOOK

ROUTE DETAILS FOR OPTION 1



Legend

Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circuit
- Access Road
- Chuckwalla Gen-Tie ROW
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

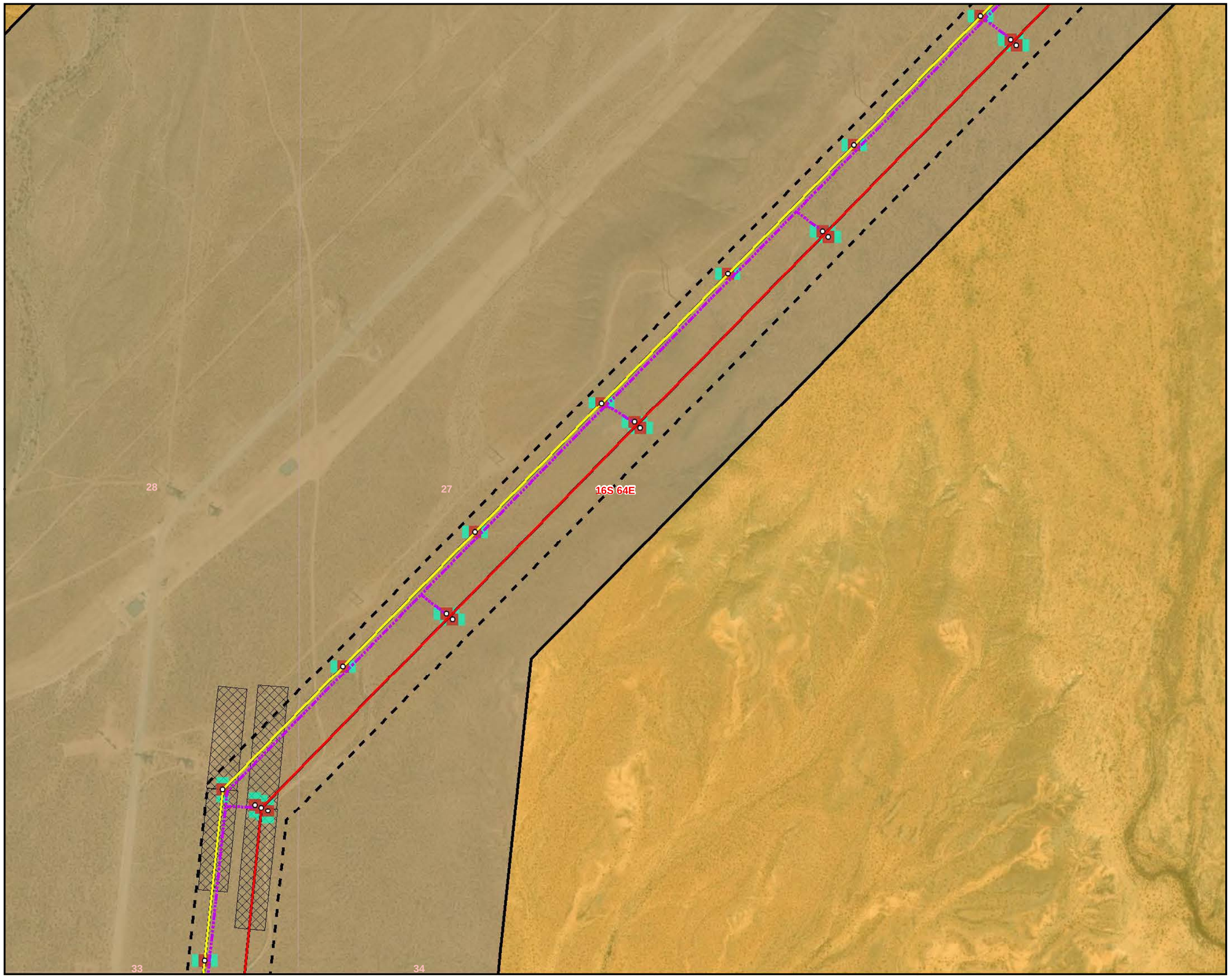
Chuckwalla Solar Projects

BLM Jurisdiction - Option 1

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 1	Author: rnc

G:\MXD's\Project Location_073021.mxd



Legend

Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circut
- Access Road
- Chuckwalla Gen-Tie ROW
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

BLM Jurisdiction - Option 1

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 2	Author: rnc

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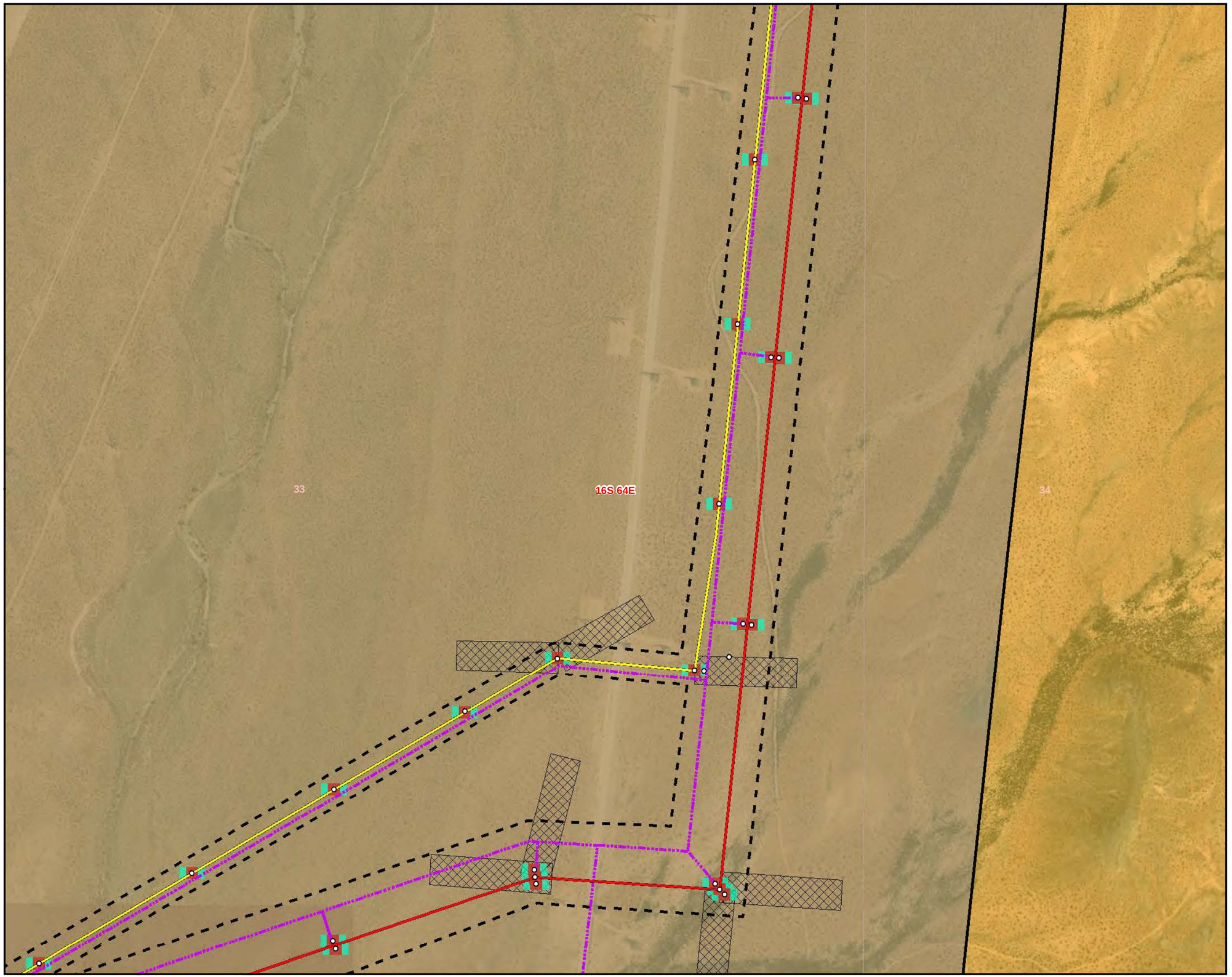

Legend

Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circut
- Access Road
- Chuckwalla Gen-Tie ROW
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

BLM Jurisdiction - Option 1

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 3	Author: rnc

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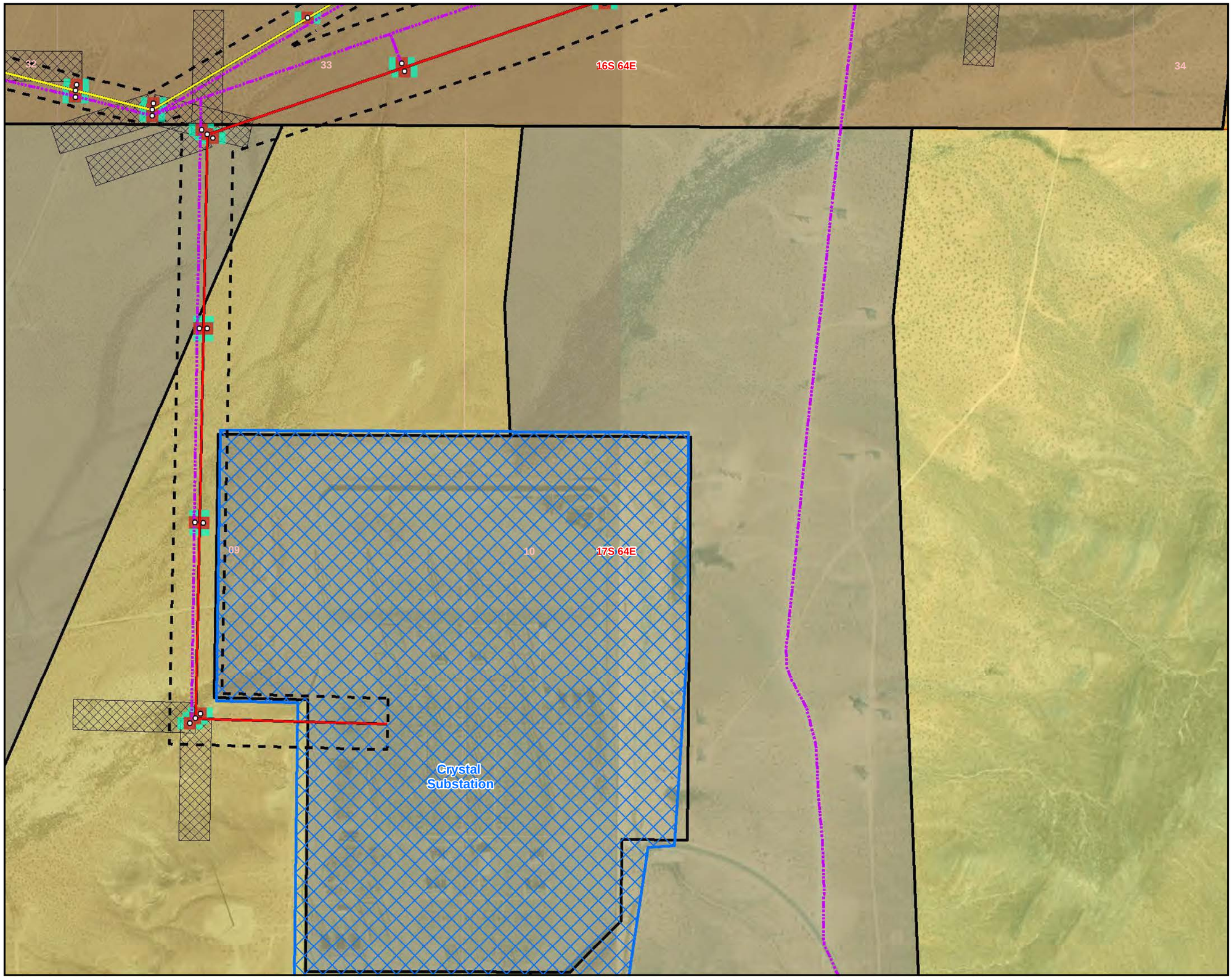

Legend

Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circut
- Access Road
- Chuckwalla Gen-Tie ROW
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

BLM Jurisdiction - Option 1

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 4	Author: rnc

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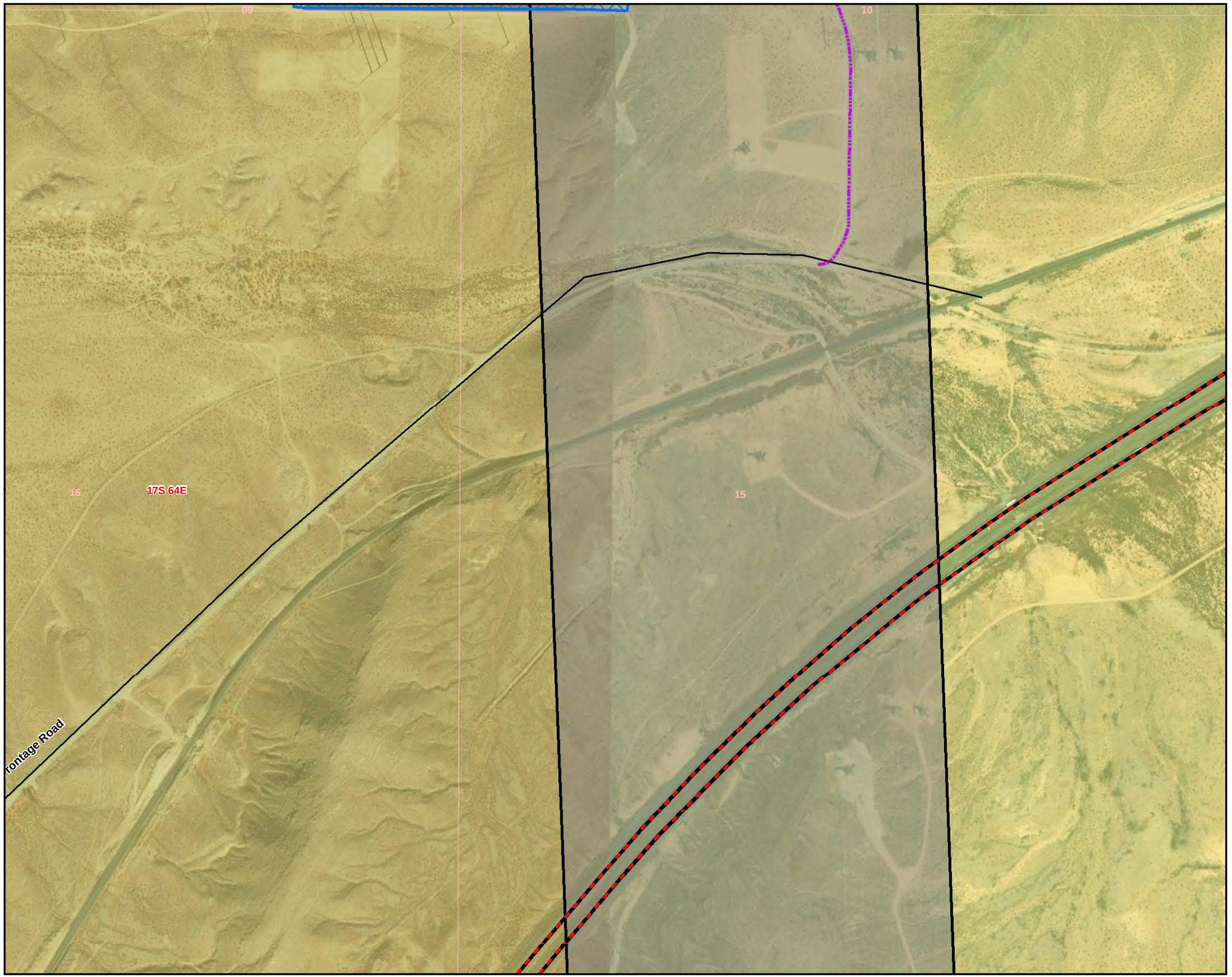

Legend

Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circut
- Access Road
- Chuckwalla Gen-Tie ROW
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

BLM Jurisdiction - Option 1

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 5	Author: rnc

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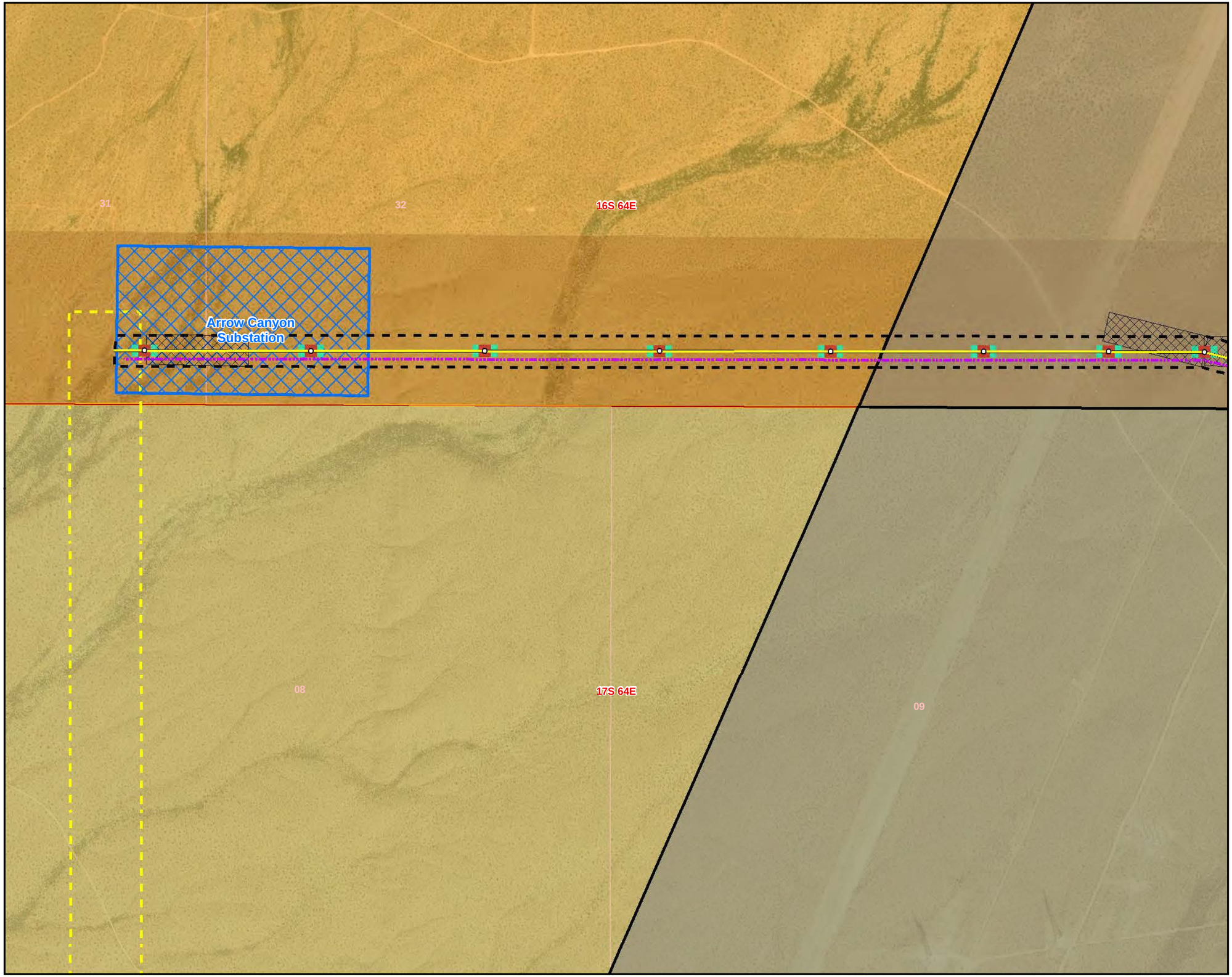

Legend

Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circut
- Access Road
- Chuckwalla Gen-Tie ROW
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

BLM Jurisdiction - Option 1

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 6	Author: rnc

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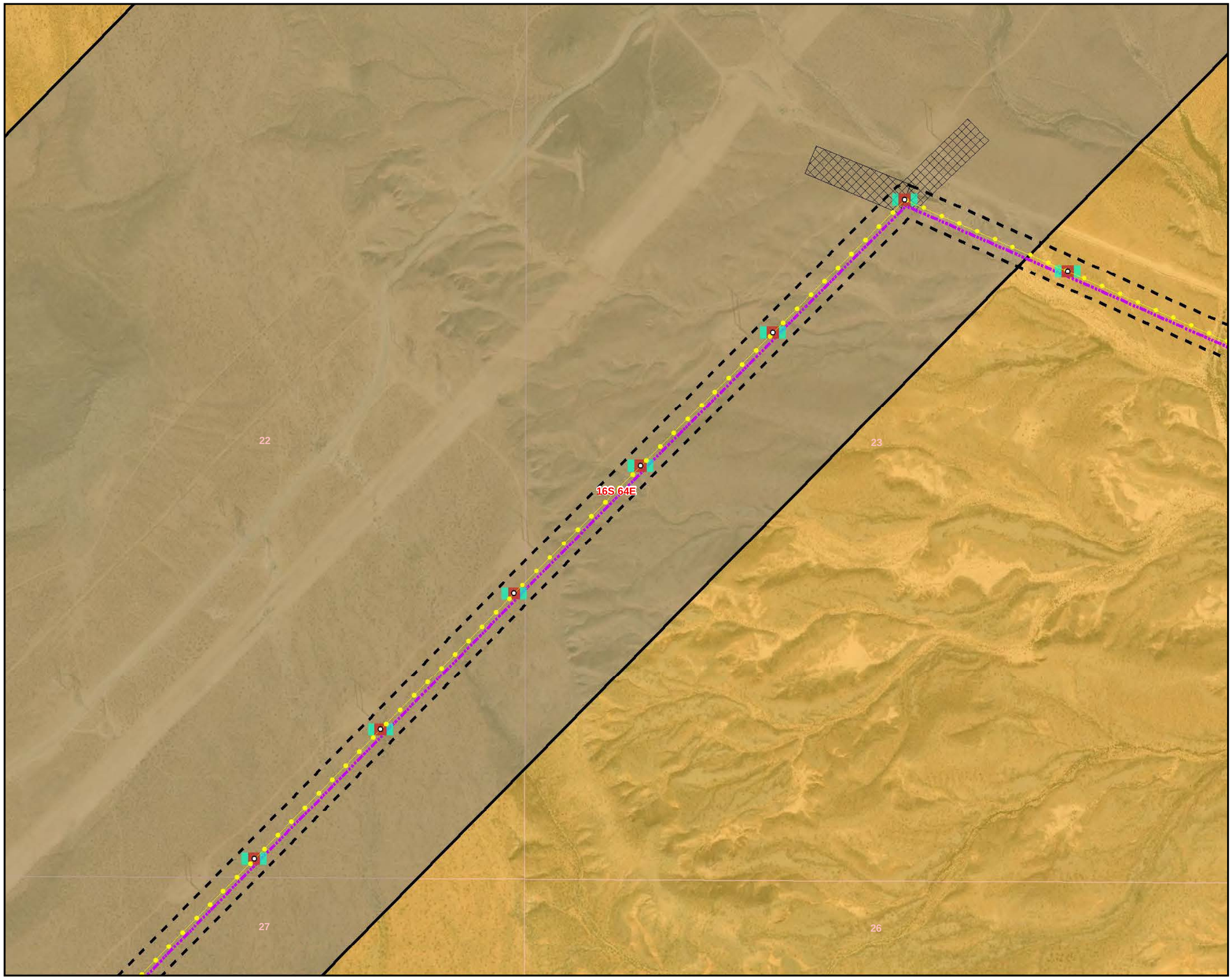
MAPBOOK

ROUTE DETAILS FOR OPTION 2



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Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circut
- 230 kV Transmission Line, Double Circuit
- 230 kV Transmission Line, Single Circut
- Access Road
- Chuckwalla Gen-Tie ROW
- Proposed 230/500 Substation
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

BLM Jurisdiction - Option 2

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 1	Author: rnc

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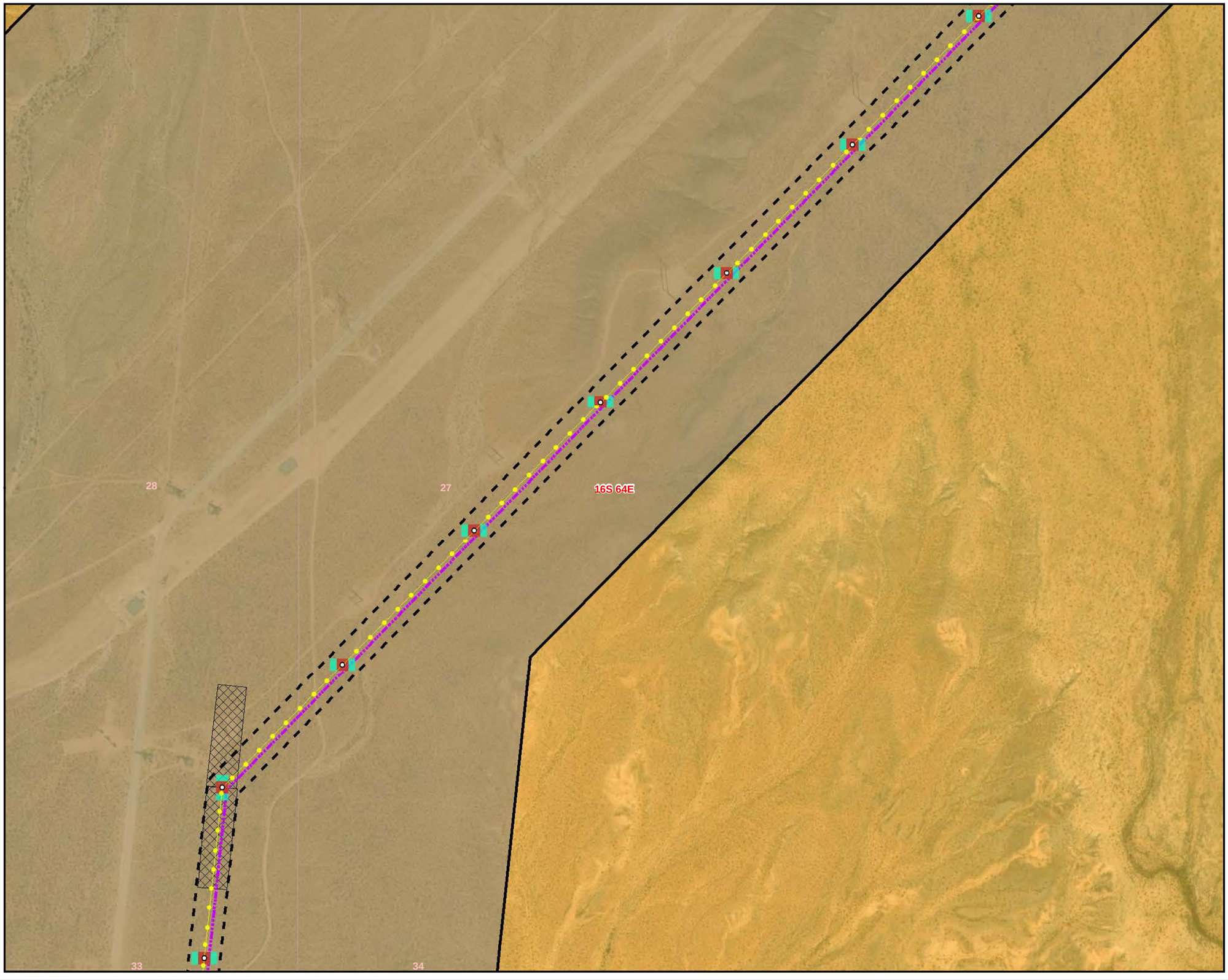

Legend

Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circut
- 230 kV Transmission Line, Double Circuit
- 230 kV Transmission Line, Single Circut
- Access Road
- Chuckwalla Gen-Tie ROW
- Proposed 230/500 Substation
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

BLM Jurisdiction - Option 2

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 2	Author: rnc

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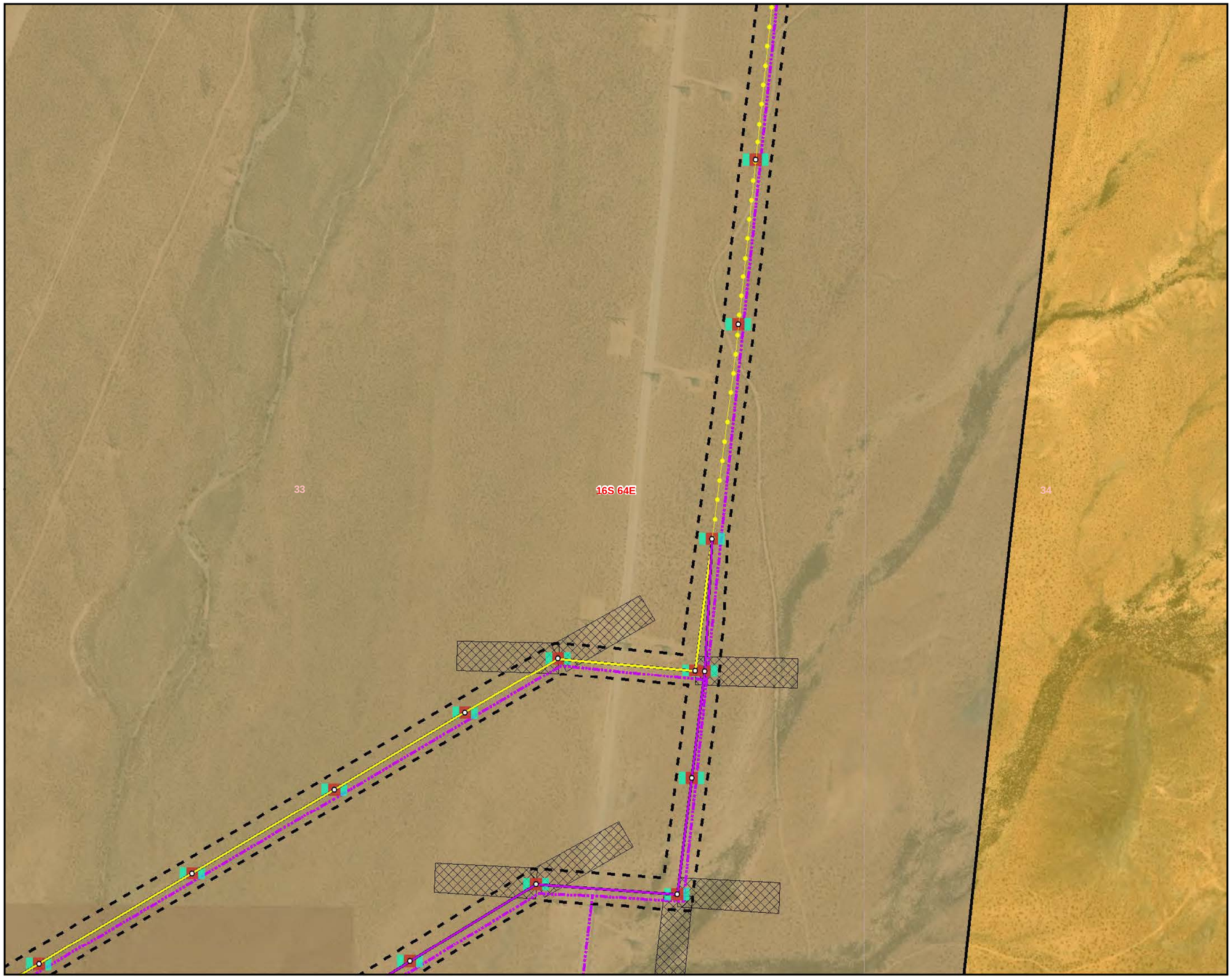

Legend

Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circuit
- 230 kV Transmission Line, Double Circuit
- 230 kV Transmission Line, Single Circuit
- Access Road
- Chuckwalla Gen-Tie ROW
- Proposed 230/500 Substation
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

BLM Jurisdiction - Option 2

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 3	Author: rnc

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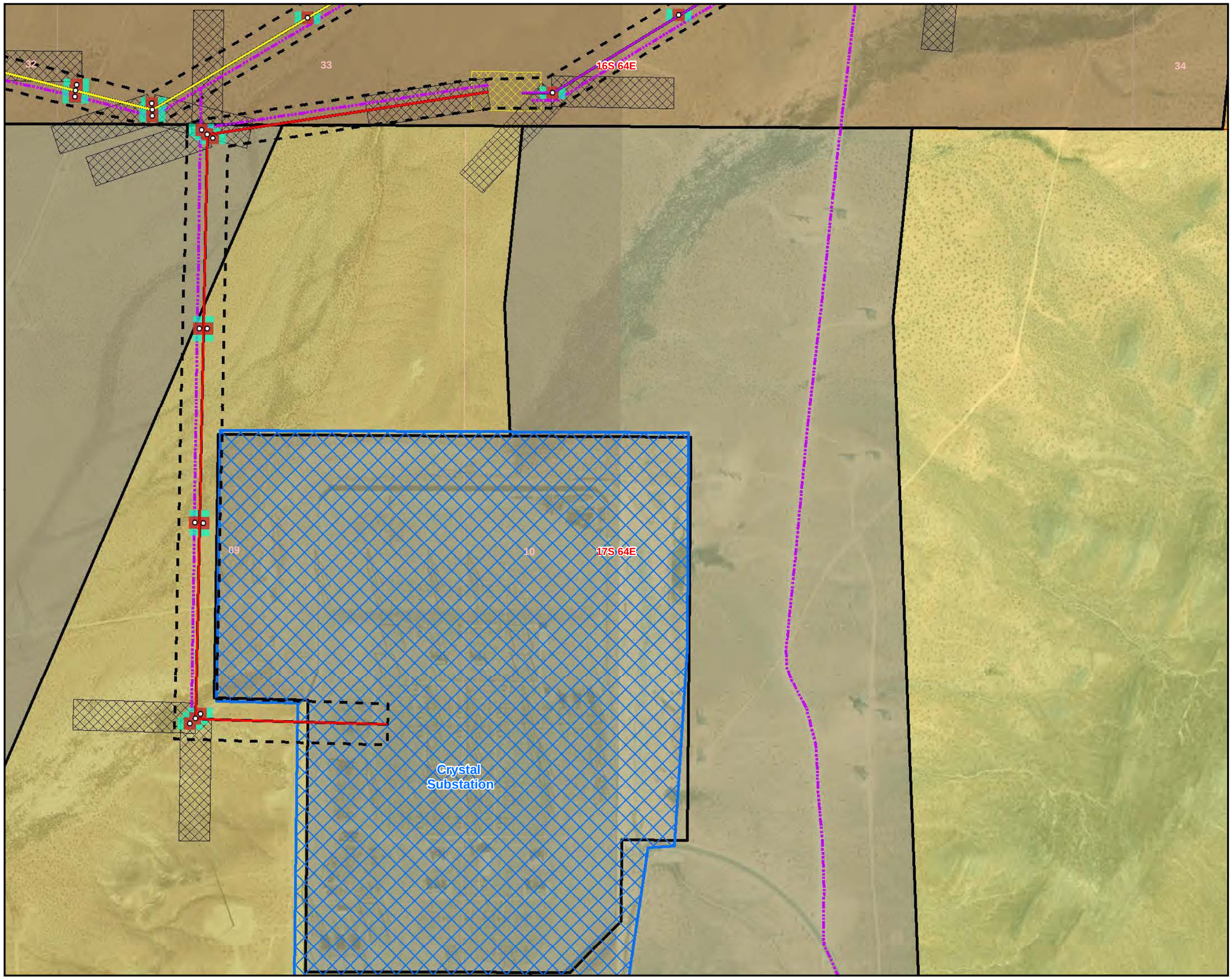

Legend

Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circut
- 230 kV Transmission Line, Double Circuit
- 230 kV Transmission Line, Single Circut
- Access Road
- Chuckwalla Gen-Tie ROW
- Proposed 230/500 Substation
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

BLM Jurisdiction - Option 2

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 4	Author: rnc

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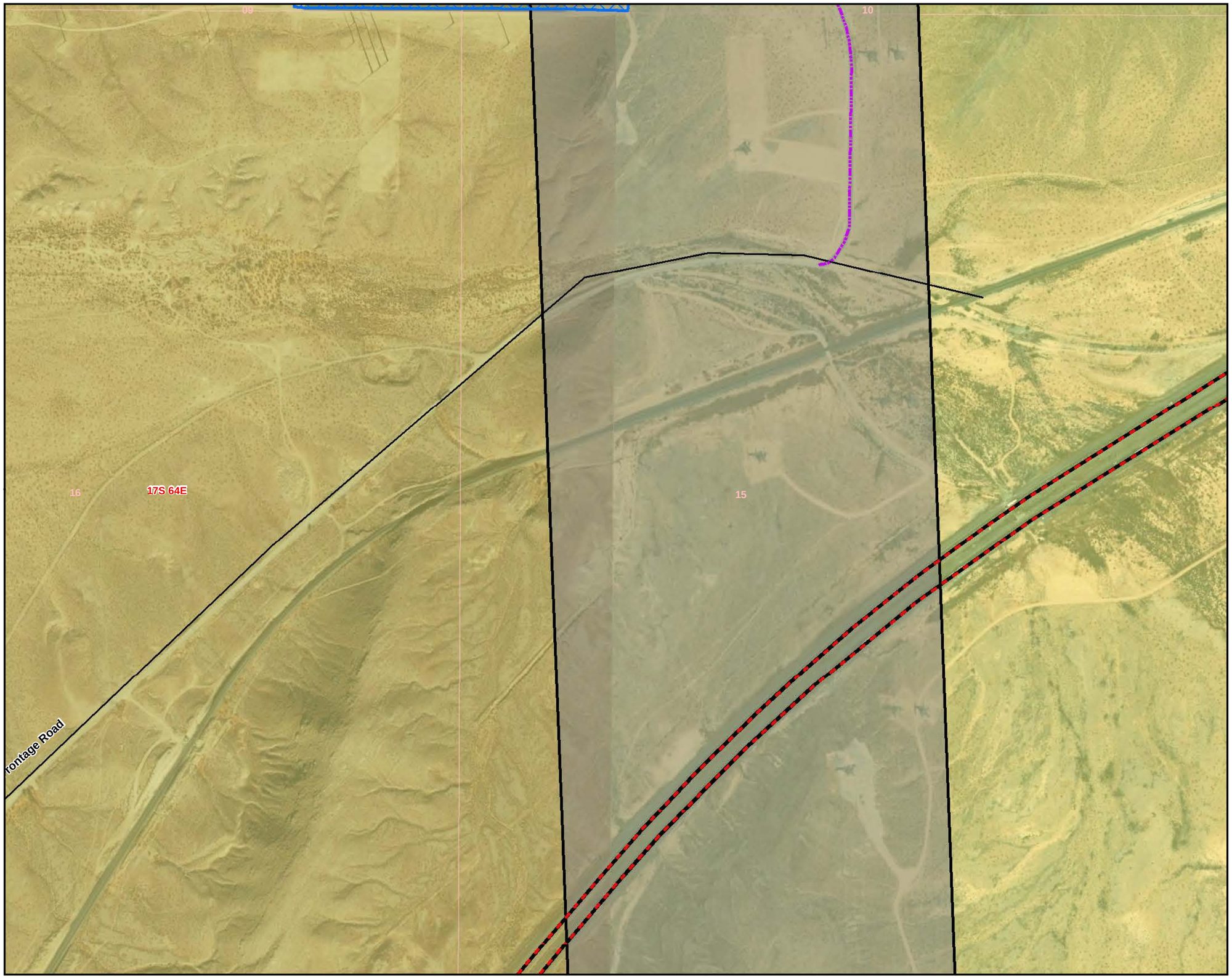

Legend

Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circut
- 230 kV Transmission Line, Double Circuit
- 230 kV Transmission Line, Single Circut
- Access Road
- Chuckwalla Gen-Tie ROW
- Proposed 230/500 Substation
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

BLM Jurisdiction - Option 2

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 5	Author: rnc

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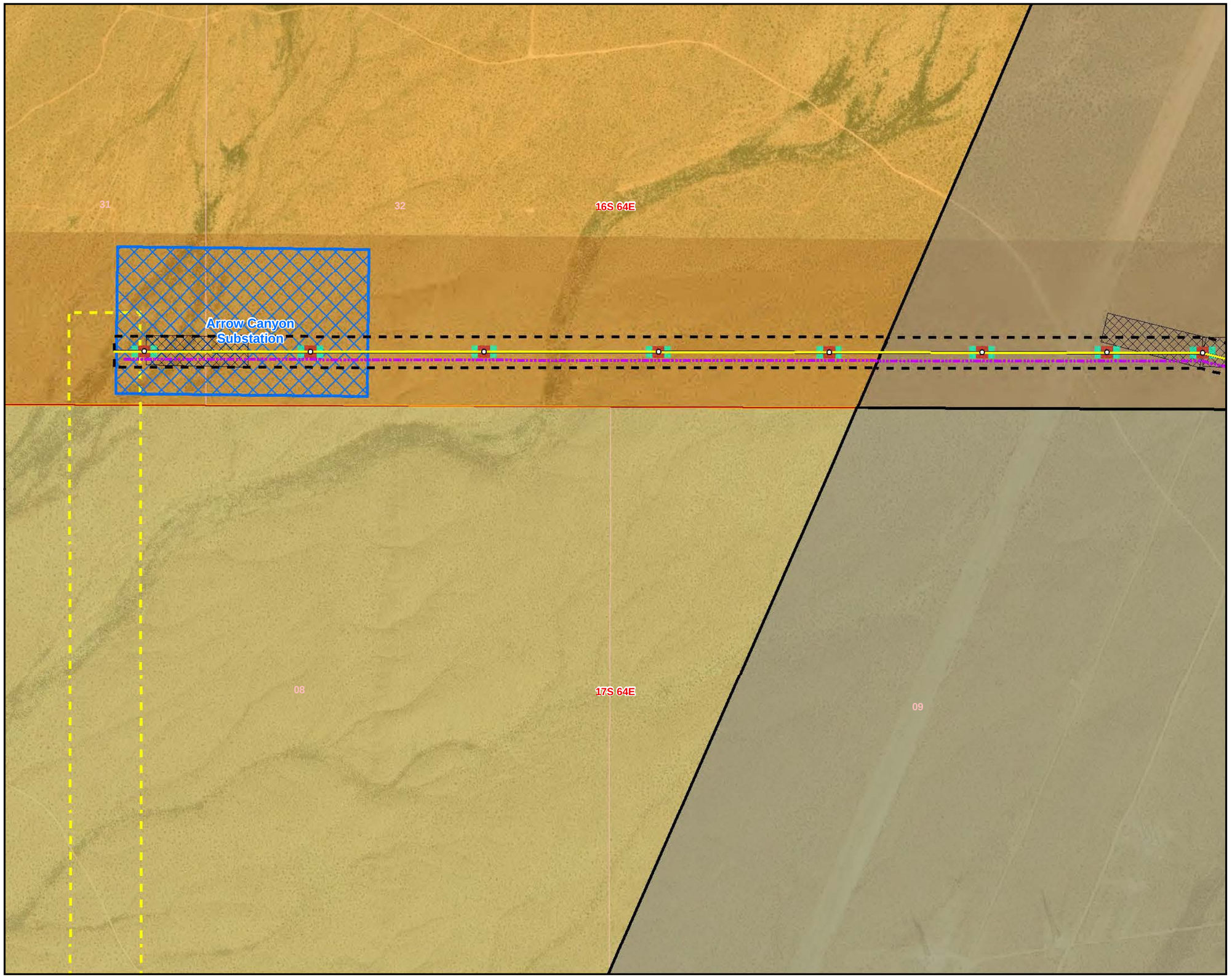

Legend

Project Components

- Proposed Structure Location
- 230 kV Transmission Line, Single Circuit
- 500 kV Transmission Line, Single Circut
- 230 kV Transmission Line, Double Circuit
- 230 kV Transmission Line, Single Circut
- Access Road
- Chuckwalla Gen-Tie ROW
- Proposed 230/500 Substation
- Stringing Sites
- Permanent Structure Work Area
- Temporary Structure Work Area

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 500 1,000

Feet

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

BLM Jurisdiction - Option 2

Map Extent: Clark County, Nevada

Date: 07-30-21	Mapbook Page 6	Author: rnc

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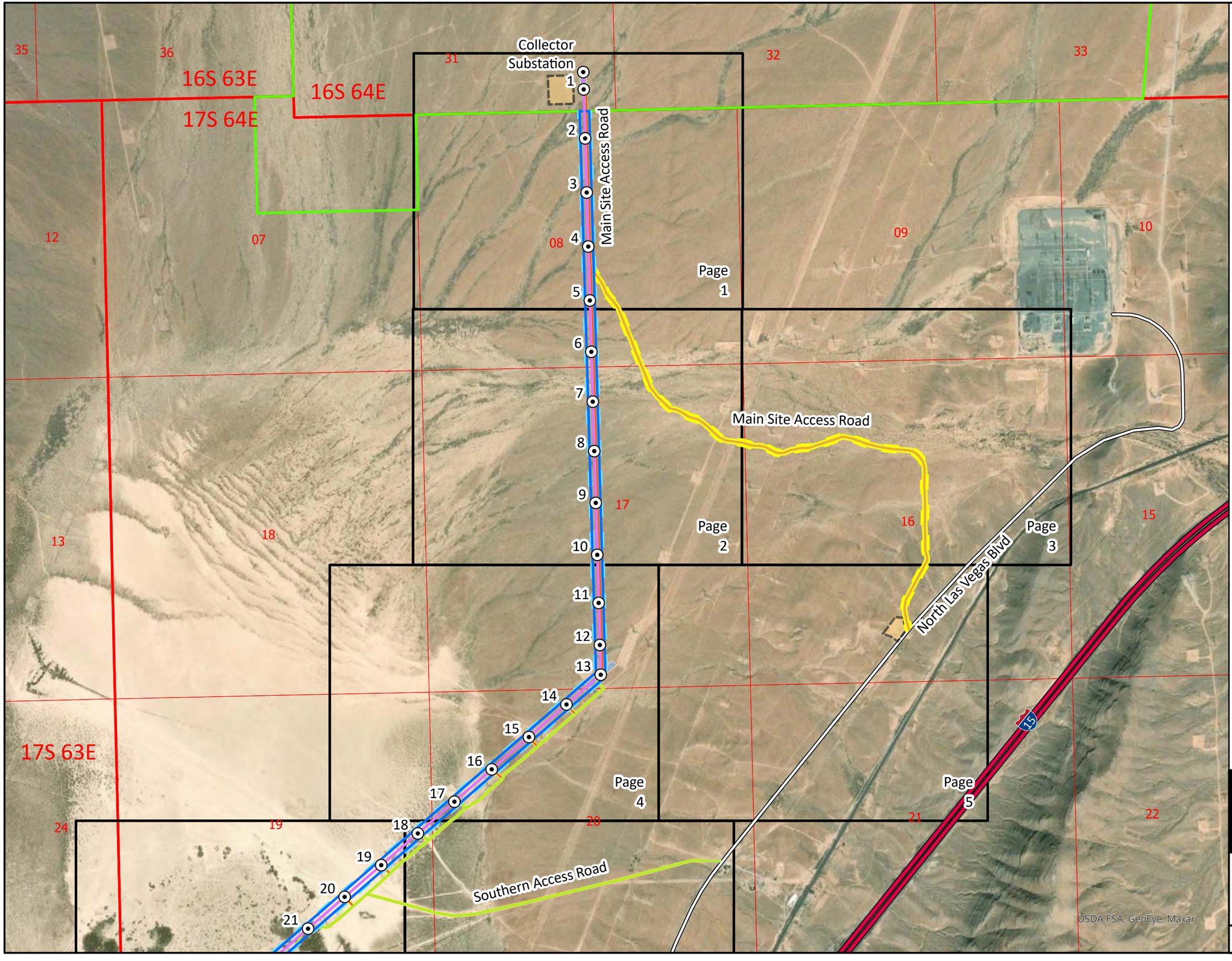
MAPS

ROUTE DETAILS FOR EXISTING ROW
BETWEEN ARROW CANYON AND HARRY ALLEN SUBSTATION



Arrow Canyon Site Boundary

Detail Page

Transmission Line

Transmission Line Permanent ROW

Transmission Line Temporary ROW

Transmission Line Centerline

Transmission Line Structures

Laydown / Staging Area

Pull Site

N
W E
S

0 0.25 0.5 Miles

Arrow Canyon - Harry Allen Plan of Development

Project Overview, North Half

Author: MS

Date: 4 March 2021

Harry Allen Substation ROW N-12873

Detail Page (Figure 4)

Transmission Line

Transmission Line Permanent ROW

Transmission Line Temporary ROW

Transmission Line Centerline

Transmission Line Structures

Laydown / Staging Area

Pull Site

N

W E

S

0 0.25 0.5 Miles

Arrow Canyon - Harry Allen Plan of Development

Project Overview, South Half

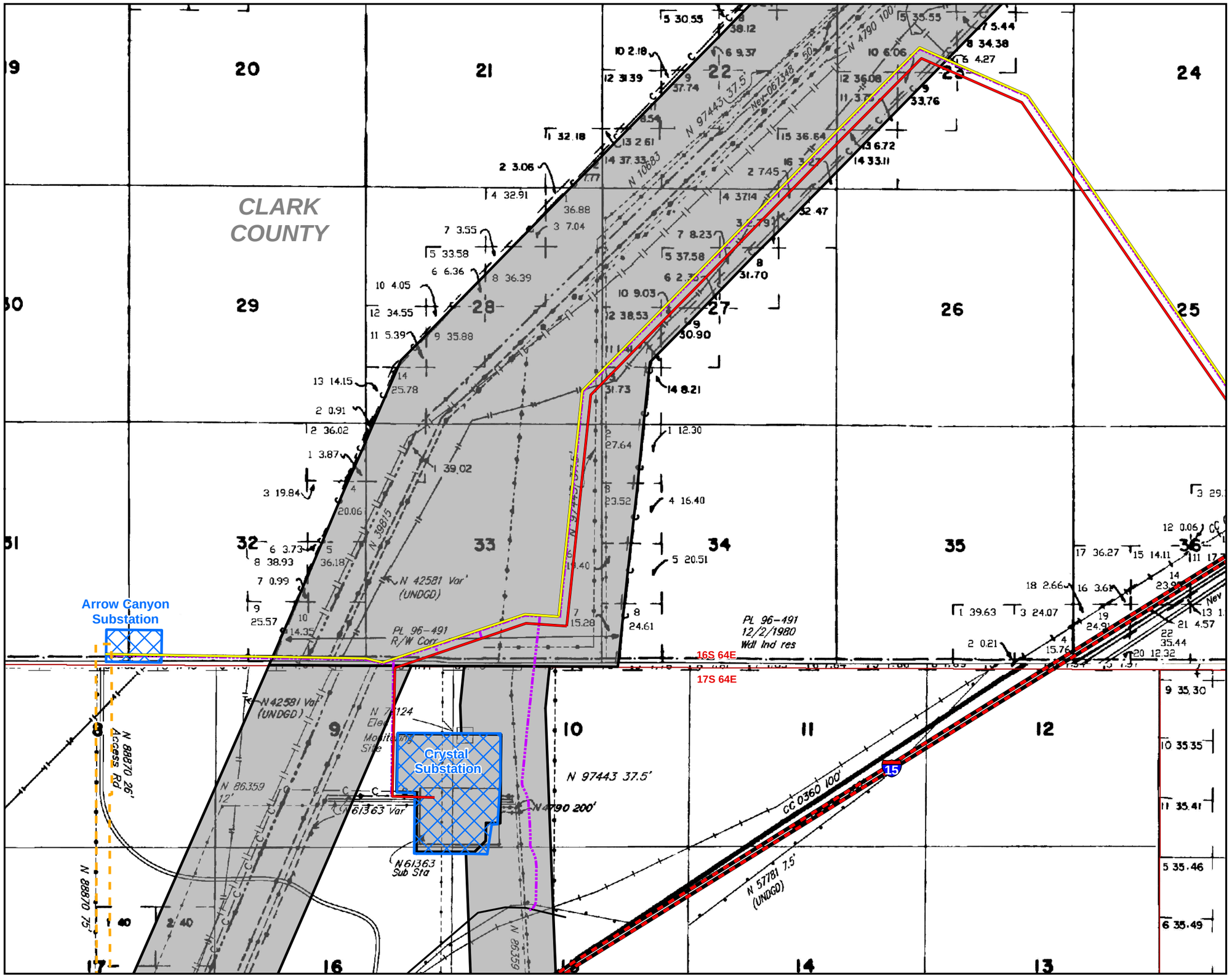
Author: MS

Date: 4 March 2021

USDA FSA, GeoEye, Maxar

MASTER TITLE PLAT MAPS

FOR OPTIONS 1 AND 2



Legend

Project Components

- Chuckwalla 230 kV Transmission Line, Single Circuit
- Tavaci 500 kV Transmission Line, Single Circut
- Access Road
- Approved ROW Arrow Canyon - Harry Allen

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township

0 0.25 0.5

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

Option 1
BLM Master Title Plats

Map Extent: Clark County, Nevada

Date: 07-19-21		Author: rnc

G:\MXD's\Project Location_071921.mxd

CLARK COUNTY

Arrow Canyon Substation

Crystal Substation

16S 64E

17S 64E

PL 96-491 12/2/1980 Wdl Ind res

PL 96-491 R/W Corr

N 42581 Var' (UNDGD)

N 97443 37.5'

N 4790 200'

N 88870 26' Access Rd

N 88870 75'

N 86359 12'

N 61363 Var

N 61363 Sub Sta

N 57781 7.5' (UNDGD)

CC 0360 100'

N 7124 Elec Monitoring Site

Legend

Project Components

- Chuckwalla 230 kV Transmission Line, Single Circuit
- Tavaci 500 kV Transmission Line, Single Circuit
- Chuckwalla 230 kV Transmission Line, Double Circuit
- Tavaci 230 kV Transmission Line, Single Circuit
- Access Road
- Approved ROW Arrow Canyon - Harry Allen
- Proposed Tavici Switching Station - 230 kV

General Features

- Interstate
- Major Highway
- Railroad
- Existing Substation
- Designated Utility Corridor
- Township

0 0.25 0.5

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

Option 2
BLM Master Title Plats

Map Extent: Clark County, Nevada

Date: 07-19-21		Author: rnc

G:\MXD's\Project Location_071921.mxd

APPENDIX A

LEGAL DESCRIPTIONS FOR OPTION 1 AND OPTION 2

LEGAL DESCRIPTION
Chuckwalla Gen-Tie Lines on BLM-Managed Land – Option 1

Option 1, Legal Description for Gen-Tie Right-of-Way

T. 16 S., R. 64 E.,
sec. 22, Lot 15, NE¼SE¼, SW¼SE¼
sec. 23, Lots 5, 6, 10, 12 and 13, SW¼NW¼
sec. 27, Lots 2, 4, 5, 7, 10, 12, and 13, NE¼NW¼, SW¼NW¼
sec. 28, NE¼SE¼, SE¼SE¼
sec. 32, Lot 10, SE¼SE¼
sec. 33, NE¼NE¼, NE¼SE¼, SE¼NE¼, SE¼SE¼, SE¼SW¼, SW¼SE¼, SW¼SW¼
Acres: 22.85
T. 17 S., R. 64 E.,
sec. 09, Lots 5 and 6, NE¼SE¼, NW¼SE¼, SE¼NE¼, SE¼SE¼, SW¼NE¼, SW¼SE¼
Acres: 195.88

Total Proposed Project Gen-Tie ROW Acreage: 218.72 acres
(Designated Utility Corridor: 195.87 acres, BLM: 22.85 acres)

Legal Description for Temporary Use Areas Outside the ROWs (Gen-Tie Pull Sites)

T. 16 S., R. 64 E.,
sec. 23, Lot 5
sec. 28, NE¼SE¼, SE¼SE¼
sec. 33, NW¼SE¼, SE¼SE¼, SW¼SE¼, SW¼SW¼
Acres: 15.46
T. 17 S., R. 64 E.,
sec. 9, Lots 5 and 6, NW¼SE¼, SE¼SE¼, SW¼NE¼, SW¼SE¼
Acres: 5.79

Total Temporary Use Areas Outside the ROWs (Gen-Tie Pull Sites): 21.25 acres
(Designated Utility Corridor: 15.46 acres, BLM: 5.79 acres)

Legal Description for Existing Gen-Tie Access Roads

T. 16 S., R. 64 E.,
sec. 33, SE¼SE¼, SW¼SE¼
Acres: 0.62
T. 17 S., R. 64 E.,
sec. 10, Lot 7, NE¼SW¼, SE¼NW¼, SE¼SW¼
sec. 15, NE¼NW¼
Acres: 3.08

Total Existing Gen-Tie Access Roads Acreage: 3.7 acres
(Designated Utility Corridor: 0.62 acres, BLM: 3.08 acres)

Legal Description for Approved Gen-Tie Between Arrow Canyon and Harry Allen Substations (N-88870)

T. 17 S., R. 63 E.,
sec. 25, E½NE¼, SW¼NE¼, E½SW¼, SW¼SW¼, and NW¼SE¼
sec. 35, lot 4, NE¼, and NE¼SE¼
sec. 36, lot 1, and NW¼NW¼

T. 18 S., R. 63 E.,
sec. 1, lot 4, S½NW¼, NE¼SW¼, W½SE¼, and SE¼SE¼
sec. 12, NE¼NE¼

T. 17 S., R. 64 E.,
sec. 8, lot 6, SW¼NE¼, and W½SE¼
sec. 16, NW¼, SW¼NE¼, E½SW¼, and W½SE¼
sec. 17, lot 1 and 2, N½NE¼, SE¼SW¼, and W½SE¼
sec. 19, lot 8, SE¼NE¼, SE¼SW¼, N½SE¼, and SW¼SE¼
sec. 20, N½NW¼, SW¼NW¼, NW¼NE¼
sec. 30, lot 5 and 6, and NE¼NW¼

T. 18 S., R. 64 E.,
sec. 7, lot 15 thru 17

Total Approved Gen-Tie (Arrow Canyon-Harry Allen) Acreage: 138.18 acres
(BLM: 138.18 acres)

LEGAL DESCRIPTION
Chuckwalla Gen-Tie Lines on BLM-Managed Land – Option 2

Option 2, Legal Description for Gen-Tie Right-of-Way

T. 16 S., R. 64 E.,
sec. 22, Lot 15, NE¼SE¼, SW¼SE¼
sec. 23, Lots 5, and 12, SW¼NW¼
sec. 27, Lots 2, 4, 5, 7, 10, 12, and 13, NE¼NW¼, SW¼NW¼
sec. 28, NE¼SE¼, SE¼SE¼
sec. 32, Lot 10, SE¼SE¼
sec. 33, NE¼NE¼, NE¼SE¼, SE¼NE¼, SE¼SE¼, SE¼SW¼, SW¼SE¼, SW¼SW¼
Acres: 97.69 acres
T. 17 S., R. 64 E.,
sec. 09, Lots 5 and 6, NE¼SE¼, NW¼SE¼, SE¼NE¼, SE¼SE¼, SW¼NE¼, SW¼SE¼
Acres: 18.33 acres

Total Proposed Project Gen-Tie ROW Acreage: 116.02 acres
(Designated Utility Corridor: 97.69 acres, BLM: 18.33 acres)

Legal Description for Temporary Use Areas Outside the ROWs (Gen-Tie Pull Sites)

T. 16 S., R. 64 E.,
sec. 23, Lot 5
sec. 28, NE¼SE¼, SE¼SE¼
sec. 33, NW¼NE¼, SE¼SE¼, SE¼SW¼, SW¼SE¼, SW¼SW¼
Acres: 11.43 acres
T. 17 S., R. 64 E.,
sec. 9, Lots 5 and 6, NW¼SE¼, SE¼SE¼, SW¼NE¼, SW¼SE¼
Acres: 5.98 acres

Total Temporary Use Areas Outside the ROWs (Gen-Tie Pull Sites): 17.41 acres
(Designated Utility Corridor: 11.43 acres, BLM: 5.98 acres)

Legal Description for Existing Gen-Tie Access Roads

T. 16 S., R. 64 E.,
sec. 33, SE¼SE¼, SW¼SE¼
Acres: 0.62
T. 17 S., R. 64 E.,
sec. 10, Lot 7, NE¼SW¼, SE¼NW¼, SE¼SW¼
sec. 15, NE¼NW¼
Acres: 3.08

Total Existing Gen-Tie Access Roads Acreage: 3.7 acres
(Designated Utility Corridor: 0.62 acres, BLM: 3.08 acres)

Legal Description for Approved Gen-Tie Between Arrow Canyon and Harry Allen Substations (N-88870)

T. 17 S., R. 63 E.,
sec. 25, E½NE¼, SW¼NE¼, E½SW¼, SW¼SW¼, and NW¼SE¼
sec. 35, lot 4, NE¼, and NE¼SE¼
sec. 36, lot 1, and NW¼NW¼

T. 18 S., R. 63 E.,
sec. 1, lot 4, S½NW¼, NE¼SW¼, W½SE¼, and SE¼SE¼
sec. 12, NE¼NE¼

T. 17 S., R. 64 E.,
sec. 8, lot 6, SW¼NE¼, and W½SE¼
sec. 16, NW¼, SW¼NE¼, E½SW¼, and W½SE¼
sec. 17, lot 1 and 2, N½NE¼, SE¼SW¼, and W½SE¼
sec. 19, lot 8, SE¼NE¼, SE¼SW¼, N½SE¼, and SW¼SE¼
sec. 20, N½NW¼, SW¼NW¼, NW¼NE¼
sec. 30, lot 5 and 6, and NE¼NW¼

T. 18 S., R. 64 E.,
sec. 7, lot 15 thru 17

Total Approved Gen-Tie (Arrow Canyon-Harry Allen) Acreage: 138.18 acres
(BLM: 138.18 acres)

APPENDIX B

HELICOPTER USE PLAN

HELICOPTER USE PLAN
Chuckwalla Gen-tie Lines

Helicopter support could be used to assist in the conductor stringing operations on BLM-managed lands and other parts of the gen-tie lines. If helicopters are used, the construction contractor would utilize an approved helicopter vendor to install the pulling ropes and cables between stringing sites and transporting line workers, clipping ladders, and other tools between structure locations as necessary.

Helicopter Yard Locations

Helicopter operations would be planned to stage out of the operations and management (O&M) area or material lay down yard on the Chuckwalla Solar Projects site on tribal lands. Designated fly yards would be kept clear of all other construction activity.

Compliance and Reporting

All personnel involved in helicopter operations will be briefed and trained FAA and State of Nevada helicopter regulations. All external loads must comply with the holder's FAR 133 certificate and approved operator's manual to include an FAA approved Congested Area Plan (CAP) where applicable. Traffic and pedestrian control must be in place where applicable to protect the non- participating public.

All passenger for-hire flights must be accomplished under a FAR part 135 certificate where applicable. Any violation must be reported to the appropriate authorities within the time required by law. All incidents/accidents will be reported to the BLM, tribe, BIA, and applicant as appropriate. This includes any contact between an aircraft and some other object, regardless of perceived damage and/or federal reporting requirements.

Helicopter operations will comply with:

- OSHA Standard 1926.551, Subpart N, Helicopter Regulations.
- Federal Aviation Regulations, FAR - Part 133, Rotorcraft External - Load Operations and FAR – Part 91 General Operating Rules.
- All applicable project mitigation measures

Safety

A safety brief, plan of operations, and refresher helicopter external-load operations training shall occur at the start of all days during which helicopter external-load operations are planned to occur. The planned flight paths, landing areas, and timing and types of helicopter construction activities for the day shall be presented. At minimum, the refresher training shall include examples load types and maximum loads (internal and external) for each type of helicopter to be used that day and a demonstration of proper external-load attaching and restraining means for all types of attaching and restraining devices that may be used.

No personnel or contractor, including helicopter pilots and crewmembers, shall work in proximity to or be involved with helicopter external-load operations unless they receive the initial training and attend the daily safety brief and refresher training.

Helicopters will be operated only by qualified pilots furnished by approved Helicopter Service Providers. To qualify as a pilot on the project, each pilot shall, as a minimum:

- Have a Federal Aviation Administration Commercial Pilot Rating
- Have a current Federal Aviation Regulation bi-annual flight review
- Hold a card stating his proficiency under Federal Aviation Regulation Part 133, in Class A, Class B, and Class C external load operations
- Be trained to, capable of, and willing to conduct Class A, Class B, and Class C external load operations, and to perform long line sling load operations
- Be proficient in all sling line operations which may be involved with the construction and maintenance of power transmission lines.

Training would also be required for all project personnel being transported by a helicopter. This training is required to be documented for all crews working around project helicopter activities. Basic training includes a helicopter safety video and safety briefing administered by a construction contractor safety coordinator that covers:

- Flight principles
- Emergency procedures and equipment
- Ground safety
- Heli Pad safety
- Entering and exiting
- Door off flight
- The main and tail rotor
- Slinging
- How to carry and stow tools and equipment
- Hover exits
- Seat belt, intercom use
- Mechanical capabilities

Dust Control Measures

Water trucks will be available on site if dust abatement becomes necessary during operations.

Helicopter Public Protection

Safety and traffic control personnel will be available as needed to address and manage all issues related to members of the public and other members of the construction team not involved in helicopter operations in addition to managing traffic control at road crossings.

Pull Sites/Wire Setup Sites

Pull sites will not be utilized as a landing/staging area for helicopter wire operations due to the proximity of adjacent lines. When helicopters are operating in a pull site/wire setup site it will be essential that personnel not directly associated with the operation or properly trained remain clear of the site.

During wire stringing, helicopters will be used for pulling sock as well as the transportation of:

- Essential crew
- Insulators
- Stringing blocks
- Tools and equipment, etc.

Safety/Fire Prevention

- All personnel shall be informed of Fire Evacuation plans for the area.
- No passengers will be allowed to remain on board during the refueling process. Passengers must wait at least 50 feet away.
- No smoking shall be permitted within 50 feet of the refueling area.
- The fuel truck will be bonded to the aircraft.

Communication

Job site tailboard meetings will be conducted at the beginning of each workday and at the beginning of every major phase of work. All aviation support will attend the daily tailboard meeting.

Appendix E

Site Revegetation / Restoration Plan

Site Restoration Plan

CHUCKWALLA SOLAR PROJECTS

December 2021

Table of Contents

FIGURES

TABLES

Acronyms and Abbreviations

BESS	Battery Energy Storage System
BIA	Bureau of Indian Affairs
BMP	Best Management Practice
BLM	Bureau of Land Management
EIS	Environmental Impact Statement
EDFR	EDF Renewables Development, Inc.
Moapa Band	Moapa Band of Paiute Indians
NDOW	Nevada Department of Wildlife
NRS	Nevada Revised Statute
O&M	Operations and Maintenance
PV	Photovoltaic
Reservation	Moapa River Indian Reservation
ROW	Right-of-Way
SRP	Site Restoration Plan
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1 Introduction

EDF Renewables Development, Inc. (EDFR, Applicant) has entered into an option agreement with the Moapa Band of Paiute Indians (Moapa Band or Band) to lease up to 6,500 acres for the development of up to four solar projects collectively referred to as the Chuckwalla Solar Projects (Chuckwalla Projects or Projects) to be located on the Moapa River Indian Reservation (Reservation) in Clark County, Nevada. The four solar projects would total up to 700 megawatts (MWs) of solar energy generation each using photovoltaic (PV) technology and incorporating battery energy storage systems (BESS). The Chuckwalla Projects would include the four solar projects and all associated facilities. The Bureau of Indian Affairs (BIA), as lead agency in cooperation with the Moapa Band of Paiute Indians (Moapa Band), and other agencies, intend to prepare an Environmental Impact Statement (EIS) that will evaluate the Projects.

The proposed Chuckwalla solar generating facilities would be constructed entirely within the Reservation within a lease study area of approximately 6,500 acres of tribal trust land. These lands are all located in the southeast corner of the Reservation in an area set aside by the Band exclusively for the Chuckwalla Projects. The solar fields and associated facilities would be in Sections 13, 14, 22, 23, 24, 25, 26, 27, 34, 35, and 36; Township 16 South, Range 65 East; Mount Diablo Base Meridian. **Figure 1** shows the proposed general location for the Project.

Primary access to the Chuckwalla sites would be provided from the Valley of Fire Highway via an existing 2.5-mile road on the Reservation that parallels its southern border and would be upgraded as needed. Additional access to the northern portion of the lease area would be provided via another existing road on the Reservation. **Figure 2** shows the locations of the proposed gen-tie lines and access roads.

The water supply required for the Projects would be provided by the Moapa Band and drawn from the Moapa Band's existing water rights. The water would be provided from either existing tribal wells or a new well on the Reservation within the lease area. If the water is sourced from off-site wells, it could be delivered to the site via pipeline or truck.

1.1 Purpose

The purpose of this Site Restoration Plan (SRP) is to describe the proposed Chuckwalla Solar Projects and identify the various factors and methods to be applied toward restoring the site following construction. The goal of this SRRP and its successful implementation is to mitigate the potential impacts associated with the proposed Projects and to facilitate managed and natural restoration of the site and impacted areas toward achieving pre-project or similar conditions. This plan is a draft and will be updated prior to construction.

Appendix C (Applicant Proposed Mitigation and Best Management Practices [BMPs]) – Soils / Erosion and Biological Resources, states the following:

- Grading on the solar site would be minimized to only those areas where necessary to meet the construction and operational requirements of the Project. Where no grading occurs, existing vegetation would be mowed to a height of approximately 18 inches and driven over / crushed during construction activities where feasible and where it does not pose a safety risk. Following construction, on-site vegetation will be allowed to return to those areas and will only be mowed to avoid conflicts with solar facility operation and as necessary for safety and fire prevention.
- A Site Restoration Plan would be implemented to limit impacts to native, on-site vegetation as much as practicable. The Plan would define construction limits and BMP measures for soil restoration and re-planting in temporary impact areas such as gen-tie work areas, and establish monitoring and success criteria as applicable; and
- Potential closure activities could include re-grading and restoration of original site contours and re-vegetation of areas disturbed by closure activities in accordance with the Site Reclamation Plan. Revegetation seed mixes will be composed of native plant species.

The objectives of this SRP include:

- Minimize initial disturbance to habitats within the proposed project area;
- Preserve site-specific materials for use in the restoration/revegetation phase, including topsoil, plants, and seeds, where practicable;
- Use native, BLM-approved plant species to revegetate disturbed areas on BLM land;
- Implement revegetation practices in a timely manner, thereby reducing secondary effects including soil erosion and establishment of noxious plant species; and
- Return the project site to conditions similar to those that existed prior to project-initiation by restoring soils, topography, plant species and their densities and distribution.

The following procedure and task matrix (**Table 1-1**) identifies the specific BMPs that will be implemented, as needed, to minimize disturbance and implement restoration of the Project sites.

Table 1-1
Procedures and Task Matrix

BMP #	Site Procedure(s)	Task Assignment and Schedule
1	Minimize temporary disturbance areas as much as practicable.	Construction Supervisors and Staff will coordinate and perform work to minimize temporary disturbance areas as much as practicable.
2	Minimize grading to only those areas where necessary to meet the construction and operational requirements of the Projects.	Construction Supervisors and Staff will coordinate and perform work to minimize unnecessary grading as much as practicable.

Table 1-1 Procedures and Task Matrix		
BMP #	**Site Procedure(s)**	**Task Assignment and Schedule**
3	All work area boundaries will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers, equipment, vehicles, and construction materials shall remain within the ROW, existing roads, and designated areas. Staging areas will be located in previously disturbed areas whenever possible.	Qualified Biologists and Environmental Managers will coordinate with Construction Supervisors and Staff to ensure that all work area boundaries are clearly marked as much as practicable and that all workers stay on designated roadways and in designated areas.
4	Preserve site-specific materials for use in the restoration phase, where practicable.	Construction Supervisors and Staff will preserve materials, as practicable, prior to the start of work.
5	Implement restoration practices in a timely manner, thereby reducing secondary effects including soil erosion and establishment of noxious plant species.	Construction Supervisors and Environmental Managers will coordinate to ensure revegetation occurs within a timely manner.

2 Roles and Responsibilities

All site Project construction, operation and maintenance (O&M) and decommissioning employees, contractors, and sub-contractors will be familiar with the SRP and will be responsible for implementing this Plan.

All Workers, Contractors, and Contractor Staff shall:

- Minimize initial disturbance within the proposed Project area;
- Preserve site-specific materials for use in the restoration phase where practicable;

Environmental Managers and/or Construction Supervisors shall:

- Implement restoration practices in a timely manner, thereby reducing secondary effects including soil erosion and establishment of noxious plant species; and
- Return areas temporarily disturbed by construction to conditions similar to those that existed prior to Project-initiation, as feasible.

Individuals responsible for general program auditing and reporting include:

- Environmental Managers and Representatives, as they relate to restoration measures.

3 Project Summary

3.1 Project Location

The proposed Chuckwalla solar generating facilities would be constructed entirely within the Reservation within a lease study area of approximately 6,500 acres of tribal trust land. These lands are all located in the southeast corner of the Reservation in an area set aside by the Band exclusively for the Chuckwalla Projects. The solar fields and associated facilities would be in Sections 13, 14, 22, 23, 24, 25, 26, 27, 34, 35, and 36; Township 16 South, Range 65 East; Mount Diablo Base Meridian, Nevada (**Figure 1** shows the Project location and **Figures 2 and 3** show the proposed Project facilities). This land was set aside by the Moapa Band of Paiute Indians (Moapa Band) exclusively for the Projects.

3.2 Project Description

The following describes the major features of the proposed Projects. For a comprehensive description of the proposed Projects, refer to the associated Chuckwalla Solar Projects Draft Environmental Impact Statement (DEIS) for the Project design details (subject to minor design changes).

3.2.1 Proposed Solar Project Components

The solar fields for the Chuckwalla Projects would be located wholly on lands within the Reservation. They would be developed using PV solar technology to generate up to 700 MWs of solar energy for four separate projects summarized in **Table 1-2** below:

Table 1-2 – Summary of Proposed Chuckwalla Solar Projects

Project	Energy Output	Lease Study Area
Chuckwalla 1a	200 MW	1,976
Shared Facilities Area	N/A	166
Chuckwalla 1b	50 MW	480
Chuckwalla 2	200 MW	1,572
Chuckwalla 3	250 MW	2,307

Figure 4 shows the proposed locations of the lease study areas for each of the four proposed Projects. Chuckwalla 1a and 1b would be built at the same time to make up the first phase of the Projects. Chuckwalla 2 and 3 would be built separately in subsequent phases. In addition to the lease areas for each project, the four projects would collectively utilize a Shared Facilities Area of approximately 165 acres containing BESS facilities, operations and maintenance (O&M) facilities, helipad, site substations, laydown areas, batch plant, and a temporary water pond / water tank that would be utilized by all four projects.

The Projects would include the following onsite key elements located within the up to 6,500-acre solar lease boundary. Onsite facilities would impact only a portion of the 6,500-acre lease area and would include:

- Solar Fields
- Battery Energy Storage System (BESS)
- Onsite Electrical Collection System and Site Substations
- Site Security and Fencing
- Communication Systems Infrastructure
- Operations and Maintenance Area
- Internal Site Roads
- Lighting
- Water Supply
- Wastewater Treatment
- Waste and Hazardous Materials Management
- Fire Protection Systems

Permanent disturbance areas would include piles, inverters/transformers, O&M area, substation, BESS, solar site roads within and between solar arrays, and drainage features. Temporary disturbance areas would include those portions of the solar field that are not graded, mowed to 18 inches and crushed, graded but not permanently occupied, and laydown areas.

3.2.2 Off-Site ROWS

The primary off-site ancillary facilities needed to support the Chuckwalla Projects include two gen-tie lines, two access roads, and a temporary water pipeline. The locations of these facilities are shown **on Figure 2**. The off-site facilities would include the following key elements located on Tribal lands, within the BLM-managed designated utility corridor on Tribal lands and a short distance on BLM-administered lands. Off-site facilities would include:

- Gen-tie Transmission Lines
- Site Access Roads
- Water Pipeline
- Site Security and Fencing

4 Existing Conditions

4.1 Vegetation

The Mojave Desert hosts a wide variety of vegetation, including approximately 250 species of annual herbaceous plants, at least 80 of which are endemic (Randall et al. 2010). Native Mojave Desert vegetation is typically tolerant of low humidity, prolonged droughts, desiccating winds, high alkalinity or salinity, rocky or very sandy soils, and the periodic influx of high quantities of water in the form of surface flooding (NDOW 2012). The Projects are located in the Mojave Warm Desert and Mixed Desert Scrub habitats (Wildlife Action Plan Team 2012).

Vegetation in the lease option area is primarily composed of Sonora-Mojave Creosotebush-White Bursage Desert Scrub (69 percent). This community is typically dominated by creosotebush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*), which can be sparse to moderately dense (2–50 percent cover). Many other shrubs, dwarf-shrubs, and cacti may be present, often as a sparse understory. In southern Nevada, common species include saltbush (*Atriplex spp*.), Mormon tea (*Ephedra nevadensis*), desert wolfberry (*Lycium andersonii*), brittlebush (*Encelia farinosa*), and beavertail cactus (*Opuntia basilaris*). The herbaceous layer is typically sparse but can be abundant with ephemerals after spring rains. Herbaceous species common in the region include phacelia (*Phacelia spp*.), desert trumpet (*Erigonium inflatum*), cryptantha (*Cryptantha spp*.), and low woollygrass (*Dasyochloa pulchella*).

The North American Warm Desert Wash vegetation community covers 31 percent of the lease option area. The vegetation of desert washes is highly variable, ranging from sparse and patchy to moderately dense. It typically occurs along the banks of washes but may occur within the channel. The woody layer is typically intermittent and relatively open and is usually dominated by shrubs and small trees such as catclaw (*Senegalia greggii*) and desert willow (*Chilopsis linearis*) (U.S. Geological Survey [USGS] 2005).

Vegetation within the off-site components that are located on Reservation land include primarily Sonora-Mojave Creosotebush-White Bursage Desert Scrub (66 percent) and North American Warm Desert Wash (28 percent), but very small areas of Sonora-Mojave Mixed Salt Desert Scrub, North American Warm Desert Bedrock Cliff and Outcrop, North American Warm Desert Pavement, Invasive Southwest Riparian Woodland and Shrubland, and Developed, Medium – High Intensity are also present in the area (accounting for approximately 6 percent).

On BLM-managed lands, the Project area includes existing access roads and the gen-tie ROWs on BLM land and existing access roads and gen-tie line ROW on the Reservation within the BLM-managed designated utility corridor. The portion of existing access roads and the gen-tie line ROWs on BLM-managed land includes 24 acres of Sonora-Mojave Creosotebush-White Bursage

Desert Scrub vegetation and 35 acres of North American Warm Desert Wash vegetation. The portion of existing access roads and the gen-tie line ROWs within the BLM-managed utility corridor includes 199 acres of Sonora-Mojave Creosotebush-White Bursage Desert Scrub vegetation, 137 acres of North American Warm Desert Wash vegetation, and 8 acres of Invasive Southwest Riparian Woodland and Shrubland. Of these areas managed by BLM, the gen-tie line ROW and the existing road providing access to the gen-tie line ROW within the BLM-managed designated utility corridor and on BLM-managed land would require disturbance.

In southern Nevada, washes tend to support a higher diversity and density of cacti and yucca than the surrounding landscape. Vegetation surveys conducted for previously approved solar projects on the Reservation identified numerous cacti and yucca species including cholla (*Cylindropuntia spp*.), barrel cactus (*Ferocactus cylindraceus*), hedgehog cactus (*Echinocereus engelmannii* var. *chrysocentrus*), and Mojave yucca (*Yucca schidigera*). Higher densities of big galleta grass (*Pleuraphis rigida*) are also commonly reported in washes in this region (BIA 2012, 2014, 2019).

Throughout the Mojave Desert, native understory vegetation is being replaced with invasive species such as red brome (*Bromus rubens*), cheatgrass (*Bromus tectorum*), Sahara mustard (*Brassica tournefortii*), halogeton (*Halogeton glomeratus*), and Russian thistle (*Salsola spp*.). Non-native annual grasses such as red brome, cheatgrass, and Mediterranean grass (*Schismus barbatus*) compete with native forage plants, and the fuel these plants create has led to increased fires in parts of the Mojave Desert where they were historically rare (Invasive Weed Awareness Coalition 2006).

4.2 Federally-Listed and Candidate, Threatened or Endangered Plant Species

A list of plant species protected under the Endangered Species Act that may occur within the Project area was obtained from the USFWS website Information for Planning and Consultation System (IPaC)(USFWS 2021) on September 23, 2021. No plant species listed as candidate, threatened or endangered species have the potential to occur within the Project area.

4.3 BLM Sensitive and State-listed Plant Species

Multiple plant species are protected under State of Nevada Revised Statute 527 and/or as BLM Sensitive species. However, there is no jurisdiction for protection of these species on BIA-managed lands. The only portion of the Projects where protection of BLM-Sensitive Species and Nevada State-listed species is applicable is on the short section of the gen-tie near the Crystal Substation on BLM lands.

5 Restoration Actions

5.1 Construction Tasks

As previously described, temporary disturbance for the Projects occurs on the Reservation, within the BLM-managed designated utility corridor on the Reservation and BLM-managed lands. Prior to the initiation of Project construction, the Chuckwalla Projects will be surveyed and staked. Survey work will consist of locating the site and ROW boundaries, the locations of proposed facilities, and the centerlines of linear features.

During construction, vegetation will be permanently cleared from new access roads and internal access roads within the solar fields and at inverter stations, substations, BESS locations and O&M facilities. Within the solar fields, native vegetation will be crushed or left in place to the extent possible with some selective trimming as needed to create a safe work environment and avoid interference with the movement of the solar panels. Vegetation within the solar arrays will be crushed or driven over, and in some cases, trimmed to a height of 18 inches, leaving the roots intact to facilitate regrowth during operations and reduce the establishment of invasive species. Construction equipment will drive over and crush the vegetation during installation of the solar arrays.

Restoration efforts at temporarily disturbed sites will begin as soon as practical during construction, after completing the soil-disturbing activities for the Projects. To maximize restoration success, revegetation activities may be timed to occur during cooler temperatures (i.e., spring and fall). For sites that may be disturbed more than once during the construction phase, temporary soil covering, stockpiling and/or erosion control will be implemented.

5.2 Post-Construction Tasks

Restoration efforts at temporarily disturbed sites will begin as soon as practical after completing the soil disturbing activities for the entire Project. For sites that may be disturbed again during the construction phase, temporary soil covering, erosion control, and weed monitoring would occur.

Temporarily disturbed areas are limited to the construction laydown areas, temporary roads, and the areas where the vegetation has been mowed (e.g. under the solar arrays, where native vegetation will be left in place and mowed to a height of 18 inches leaving the roots intact and construction equipment would drive over and crush the vegetation during installation of the arrays). Temporarily disturbed areas will be reclaimed as much as practicable. Where appropriate, graded areas could be recontoured and soils would be de-compacted. The soil surface would then be textured. Seeding with local and weed-free seed mixes recommended by the Band, BIA and BLM would be conducted on suitable areas as necessary during appropriate months following construction. Temporary roads built for construction could be reclaimed or could be maintained for use during the

operational life of the Project. The portions of construction roads to be reclaimed would be determined at the end of construction.

All restoration efforts should be implemented as soon as practical after disturbance of a site has concluded and prior to the typical rainy season of late summer and early fall. This will minimize the potential for soil loss and establishment of noxious weeds.

6 Phases of Restoration

Restoration and revegetation activities will occur primarily in two phases; 1) post-construction and 2) post-decommission.

6.1 Post-Construction

Post-construction restoration activities focus on areas that have been temporarily disturbed and will not experience additional surface disturbing activities (e.g. service roads required during construction, equipment and material laydown areas, etc.). The restoration areas do not include areas where the vegetation has been mowed (e.g. under the solar arrays) since the mowing is performed to facilitate regrowth during operations since the roots are left intact. Seeds of native herbaceous plants may be used to revegetate temporary work areas and other areas that will not be disturbed following construction. Successful revegetation will decrease the potential for soil erosion, preserving suitable conditions for plant growth, as well as maintaining structural support and foundation for the installed solar modules.

6.2 Post-Decommissioning

Post-decommissioning restoration efforts will focus on all areas within the solar facility. Post-decommission restoration will be based on similar regulations, guidelines, practices, and techniques as previously described in this report. The goal of post-decommission restoration is to restore the Project site to pre-construction conditions to the greatest extent practicable.

7 Weed Management

Weed management for this Project will be conducted throughout the life of the Project and in accordance with the Project-specific Weed Management Plan (Appendix F in DEIS).

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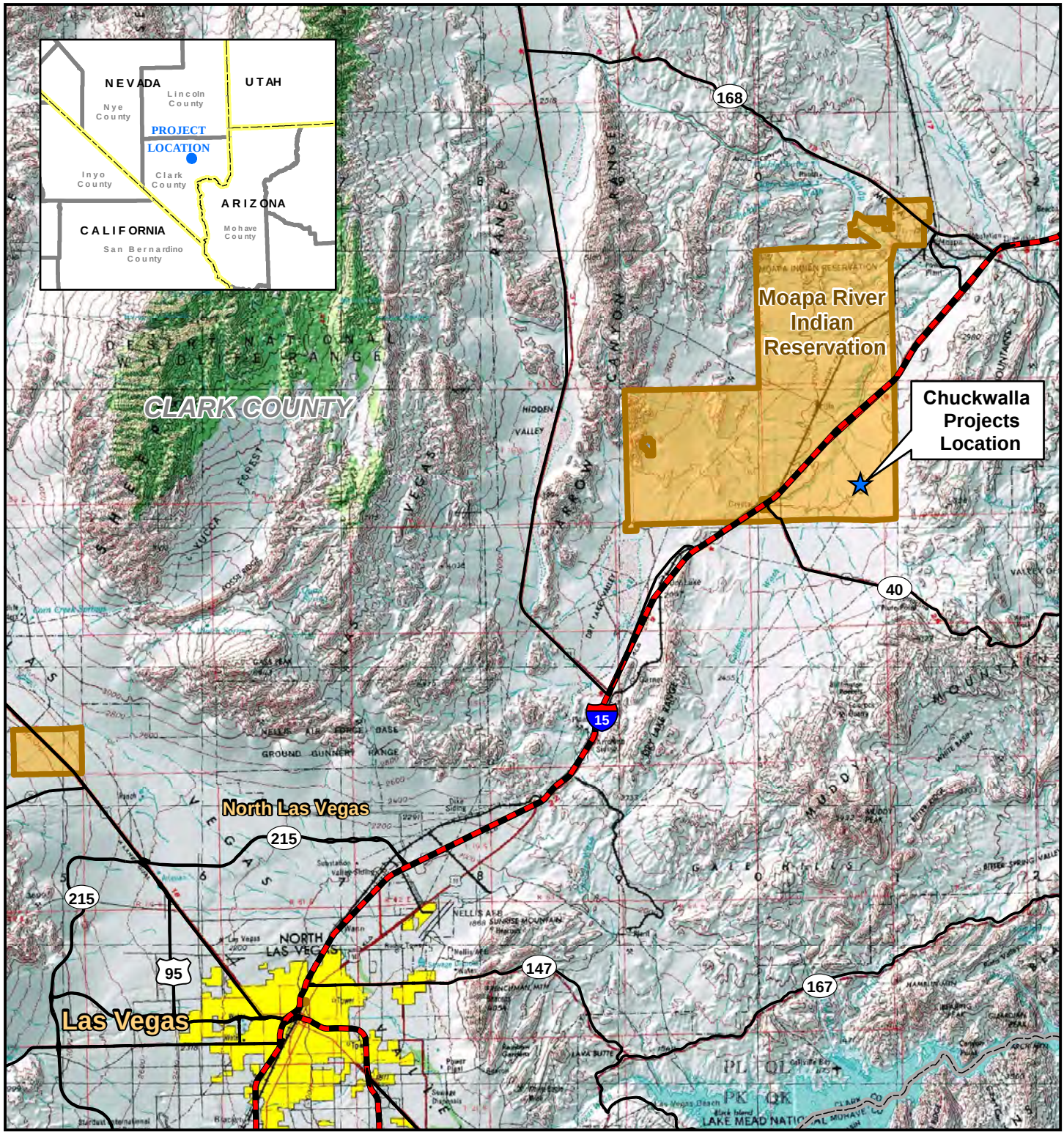
FIGURES



Legend

- Solar Project Location
- Interstate
- US/ State Highway
- Railroad

Jurisdictional Land Ownership

- Indian Reservation

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Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

FIGURE 1
General Location

Map Extent: Clark County, Nevada

Date: 11-03-20		Author: rnc

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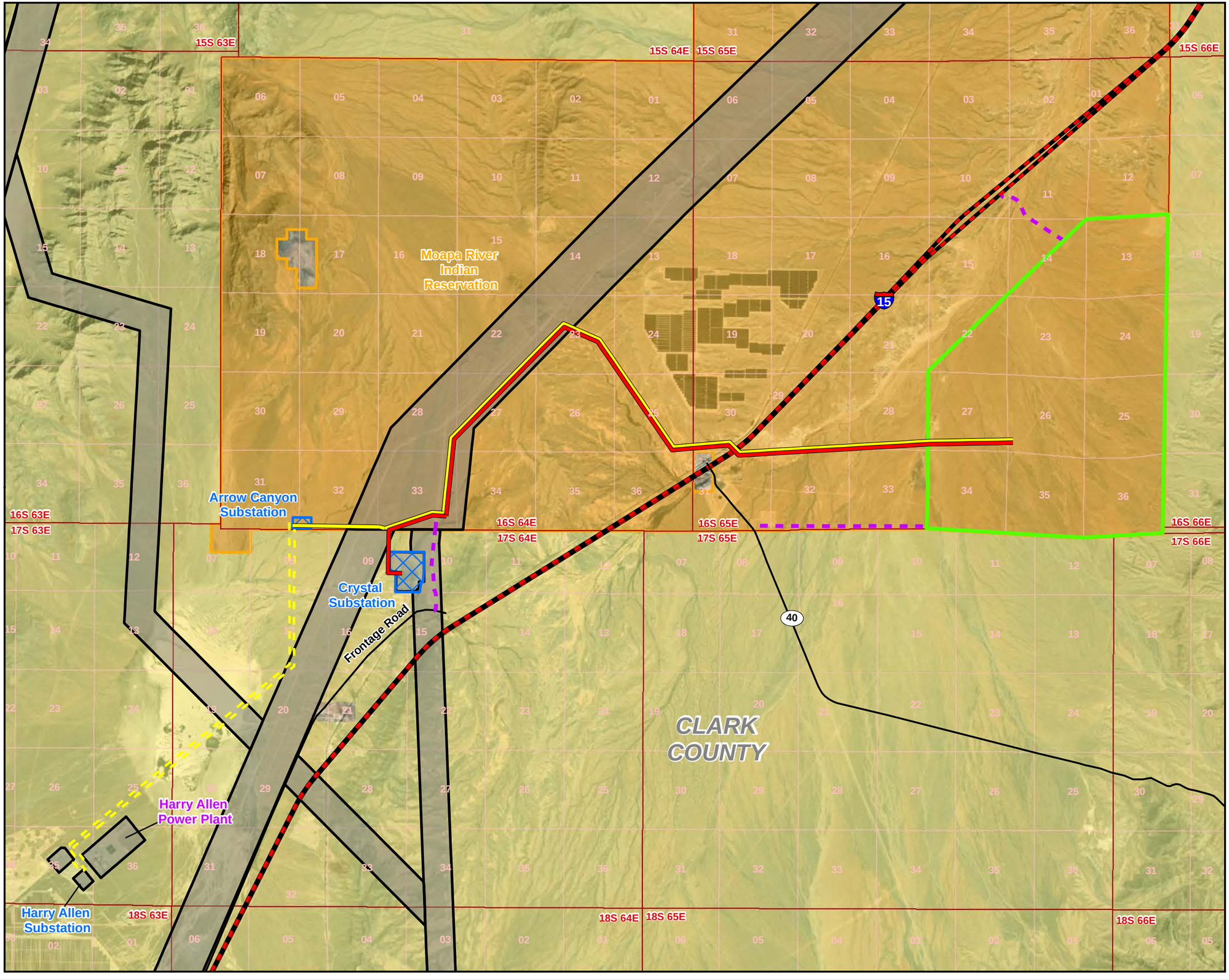

Legend

Project Components

- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Approved ROW Arrow Canyon - Harry Allen

General Features

- Interstate
- Major Highway
- Railroad
- Stream / River
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

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Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

Figure 2
Project Overview Map

Map Extent: Clark County, Nevada

Date: 07-26-21		Author: rnc

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- Met Tower
- Microwave Tower
- Water Well
- Tavaci Gentie
- Proposed Fence Line
- Railroads
- Collection Line Stream Crossings
- Project Roads
- Controlled-access Highway
- Solar Panel Area
- Inverters & Co-Located DIstributed BESS
- Drainage Ditch
- Battery Storage Yard
- Laydown Yards - Temporary
- O&M Large
- O&M Small
- Substation Main Site
- Substation Alternate Site
- Batch Plant Yard
- Construction Staging Area/Parking Lot
- HeliPad
- Dust Control Retention Pond - 180' x 300'
- Chuckwalla Phase 1A
- Chuckwalla Phase 1B
- Chuckwalla Phase 2
- Chuckwalla Phase 3
- Shared Use Area

Chuckwalla Phase 2
1573.6 acres
Tavaci

Chuckwalla Phase 1A
1976.1 acres
Chuckwalla

Shared Use
164.9 acres

Chuckwalla Phase 1B
478.7 acres
Tavaci

Chuckwalla Phase 3
2224.6 acres
Tavaci

Old Corkscrew Rd

S R-40

Valley of Fire Hwy

0 0.17 0.35 0.7 1.05 1.4 Miles

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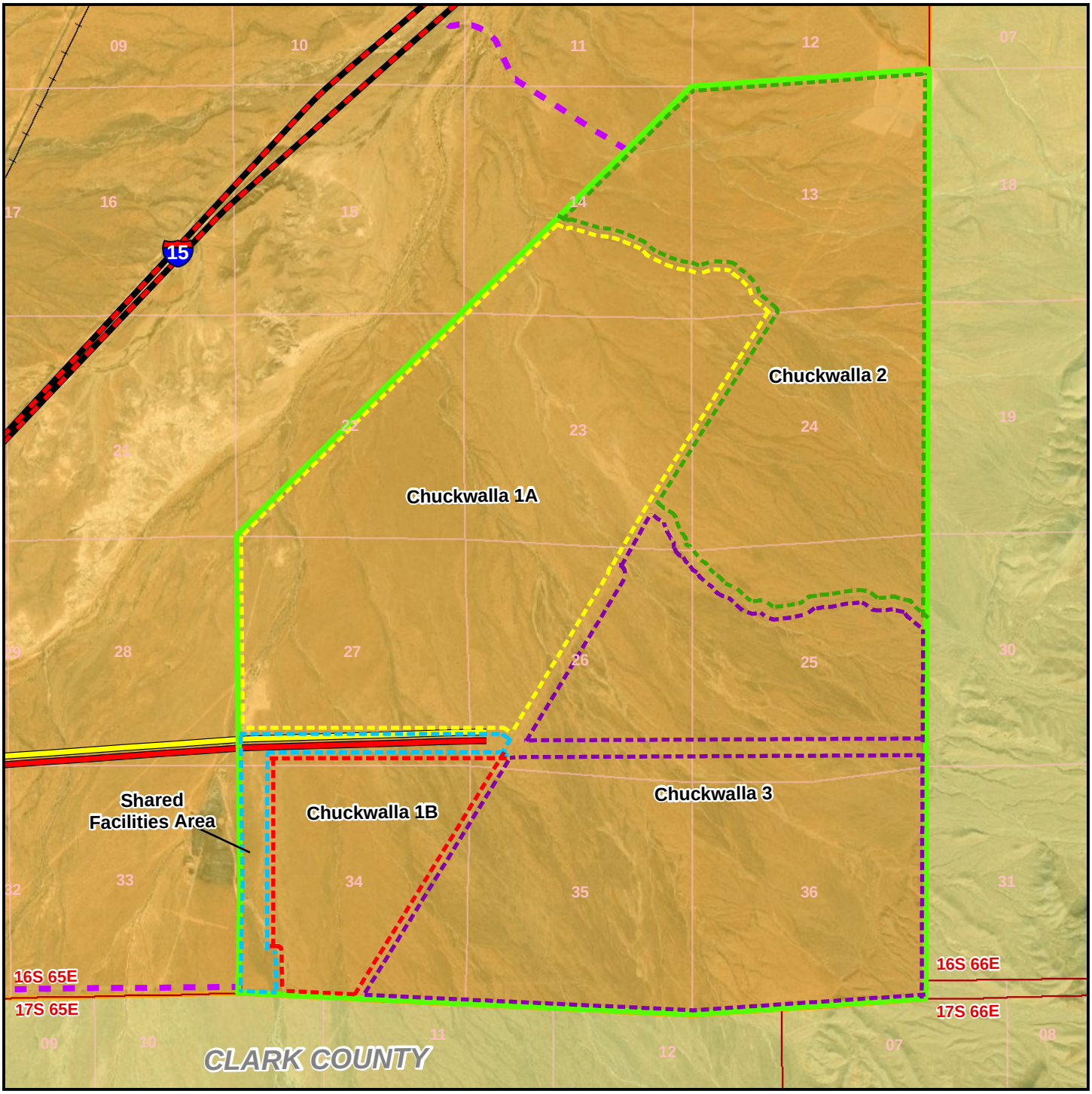
EDF renewables

Figure 3 Site Plan

Chuckwalla Solar Project | Clark County, Nevada

SP



Legend

- Chuckwalla Solar Lease Area
- Chuckwalla 1A
- Chuckwalla 1B
- Chuckwalla 2
- Chuckwalla 3
- Shared Facilities Area
- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Interstate
- Railroad
- Township
- Section
- Jurisdictional Land Ownership
- Indian Reservation
- Bureau of Land Management Land

Chuckwalla Solar Project

Figure 4
Solar Project Lease Areas

Map Extent: Clark County, Nevada

Date: 12-22-21		Author: rnc

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Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

APPENDIX A

Plant Species Observed on Proposed Project Site

Plant Species Observed in the Project Area	
Common Name	**Scientific Name**
Creosote bush	*Larrea tridentata*
White bursage	*Ambrosia dumosa*
Desert senna	*Senna armata*
Desert trumpet	*Eriogonum inflatum*
Big galleta	*Pleuraphis rigida*
Devil's spineflower	*Chorizanthe rigida*
Desert globemallow	*Sphaeralcea ambigua*
Catclaw acacia	*Senegalia greggii*
Spiny menodora	*Menodora spinescens*
Rough joint fir	*Ephedra nevadensis*
Compact brome	*Bromus madritensis*
Mediterranean grass	*Schismus barbatus*
Three awn	*Aristida purpurea*
Desert marigold	*Baileya multiradiata*
Wingnut cryptantha	*Cryptantha pterocarya*
Cleftleaf phacelia	*Phacelia crenulata*
Red brome	*Bromus tectorum*
Russian thistle	*Salsola tragus*
Gilia	*Gilia sp.*
Buckwheat	*Eriogonum sp.*
Threadleaf snakeweed	*Gutierrezia microcephala*
Cottontop cactus	*Echinocactus polycephalus*
Mojave yucca	*Yucca schidigera*
Golden cholla	*Cylindropuntia echinocarpa*
Common fishhook cactus	*Mammillaria tetrancistra*
Desert barrel cactus	*Ferocactus cylindraceus*
Beavertail cactus	*Opuntia basilaris*
Buckhorn cholla	*Cylindropuntia acanthocarpa*

Plant Species Observed in the Project Area	
Common Name	**Scientific Name**
Pencil cholla	*Cylindropuntia ramosissima*
Grizzlybear prickly pear	*Opuntia polyacantha var. erinacea*
Pincushion flower	*Chaenactis fremontii*
Brownplume wirelettuce	*Stephanomeria pauciflora*
Four o'clock	*Mirabilis sp.*
Desert indianwheat	*Plantago ovata*
Desert needlegrass	*Achnatherum speciosum*
Indian ricegrass	*Achnatherum hymenoides*
Low woollygrass	*Dasyochloa pulchella*
Four-winged salt brush	*Atriplex canescens*
Cheesebush	*Hymenoclea salsola*
Broom snakeweed	*Gutierrezia sarothrae*
Mormon tea	*Ephedra nevadensis*
*Heritage 2013, BIA 2014	

Appendix F

Weed Management Plan

Integrated Weed Management Plan

Chuckwalla Solar Projects

September 2021

Table of Contents

1.0 INTRODUCTION

EDF Renewables Development, Inc. (EDFR, Applicant) has entered into an option agreement with the Moapa Band of Paiute Indians (Moapa Band or Band) to lease up to 6,500 acres for the development of up to four solar projects collectively referred to as the Chuckwalla Solar Projects (Chuckwalla Projects or Projects) to be located on the Moapa River Indian Reservation (Reservation) in Clark County, Nevada. The Chuckwalla Projects would include the four solar projects and all associated facilities. The Bureau of Indian Affairs (BIA), as lead agency in cooperation with the Moapa Band of Paiute Indians (Moapa Band), and other agencies, intends to prepare an Environmental Impact Statement (EIS) that will evaluate the Projects.

Invasive, non-native plants, often referred to as "weeds," are considered undesirable and warrant effective management and control for a variety of reasons including competition with native and agricultural plant species, impacts to habitat function and capability, degradation of the aesthetic qualities and values of viewsheds and landscapes, and more. In the Nevada Revised Statutes (NRS 555.005) a noxious plant is defined as "any species of plant which, is, or is likely to be, detrimental or destructive and difficult to control or eradicate." As human presence and activity increases, the potential for spreading and establishing noxious and invasive plants increases.

The Nevada Department of Agriculture Plant Industry Division maintains a list of noxious weeds for the State of Nevada. Noxious weeds on this list are assigned to one of three categories, including:

- Category A Weeds: Weeds that are generally not found or that are limited in distribution throughout the State. Category A weeds are subject to active exclusion from the State and active eradication where found, including the premises of a dealer of nursery stock.
- Category B Weeds: Weeds that are generally established in scattered populations in some counties of the State. Such weeds are subject to active exclusion where possible; and active eradication from the premises of a dealer of nursery stock.
- Category C Weeds: Weeds that are generally established and generally widespread in many counties of the State. Such weeds are subject to active eradication from premises of a dealer of nursery stock.

Appendix A of this report includes a list of the state-listed noxious and invasive plant species that are relevant to the proposed Chuckwalla Solar Projects in Clark County, Nevada and the focus of this Weed Management Plan (WMP).

1.1 Purpose and Goals of this Plan

The purpose and goal of this plan is to describe methods to prevent, mitigate, and control the spread and establishment of weeds during the implementation of the Projects. The proponent of the Projects and its approved contractors would be responsible for implementing this plan working with relevant agencies to control weeds in the Project areas, understand the type and distribution of weeds in the Project areas, and to implement effective control and monitoring efforts toward reducing the spread and establishment of weeds in the Project areas. This WMP is applicable to the construction, operations, and decommissioning of the proposed Projects.

1.2 Project Description

1.2.1 Project Area

The proposed Chuckwalla solar generating facilities would be constructed entirely within the Reservation within a lease study area of approximately 6,500 acres of tribal trust land. These lands are all located in the southeast corner of the Reservation in an area set aside by the Band exclusively for the Chuckwalla Projects. The solar fields and associated facilities would be in Sections 13, 14, 22, 23, 24, 25, 26, 27, 34, 35, and 36; Township 16 South, Range 65 East; Mount Diablo Base Meridian. **Figure 1** shows the proposed general location for the Projects.

The proposed Projects would occur in the Basin and Range physiographic province in a part of the Mojave Desert. This physiographic province is characterized by the hundreds of long, narrow, and nearly parallel mountain ranges that are separated by deep valleys. These features are visible at the proposed Project sites, with nearly parallel mountain ranges situated generally in a north-south direction that are located near the proposed Project sites. The majority of the Project sites occur in a sloping valley. The proposed Project sites occur in the Mojave Desert Scrub biome and are dominated by plants common to this biome including creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*).

1.2.2 Proposed Project

The following describes the major features of the proposed Projects. For a comprehensive description of the proposed Projects, refer to the associated Chuckwalla Solar Projects Draft Environmental Impact Statement (EIS) for the Project design details (subject to minor design changes).

The four solar projects would total up to 700 megawatts (MWs) of solar energy generation each using photovoltaic (PV) technology and incorporating battery energy storage systems (BESS). Primary access to the Chuckwalla sites would be provided from the Valley of Fire Highway via an existing 2.5-mile road on the Reservation that parallels its southern border and would be upgraded, as needed. Additional access to the northern portion of the lease area would be provided via another existing road on the Reservation. **Figure 2** shows the locations of the proposed gen-tie lines and access roads.

The water supply required for the Projects would be provided by the Moapa Band and drawn from the Moapa Band's existing water rights. The water would be provided from either existing tribal wells or a new well on the Reservation within the lease area. If the water is sourced from off-site wells, it could be delivered to the sites via pipeline or truck.

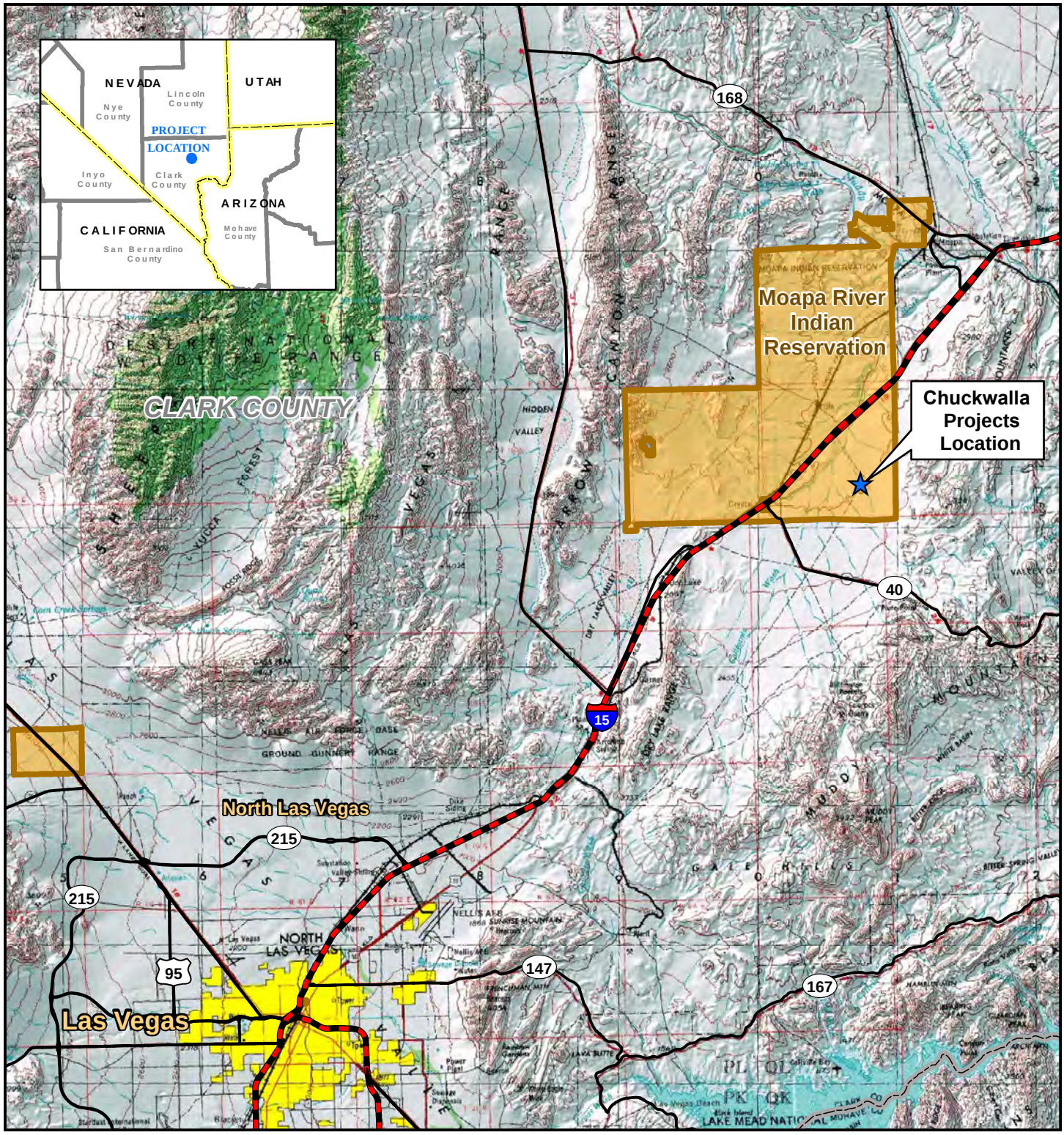
The Projects would include the following onsite key elements located within the up to 6,500-acre solar lease boundary. Onsite facilities would impact only a portion of the 6,500-acre lease area and would include:

- Solar Fields
- Battery Energy Storage System (BESS)
- Onsite Electrical Collection System and Site Substations
- Site Security and Fencing
- Communication Systems Infrastructure
- Operations and Maintenance Area
- Internal Site Roads
- Lighting
- Water Supply
- Wastewater Treatment
- Waste and Hazardous Materials Management
- Fire Protection Systems

Permanent disturbance areas would include piles, inverters/transformers, O&M area, substation, BESS, solar site roads within and between solar arrays, and drainage features. Temporary disturbance areas would include those portions of the solar field that are not graded, mowed to 18 inches and crushed, graded but not permanently occupied, and laydown areas.

Fire Prevention

The Project's fire protection water system would be supplied from up to three (3) above-ground raw water storage tanks located on the sites holding up to 12,000 gallons each. In addition, each BESS container would have its own fire detection system.



Legend

- Solar Project Location
- Interstate
- US/ State Highway
- Railroad

Jurisdictional Land Ownership

- Indian Reservation

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Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

FIGURE 1
General Location

Map Extent: Clark County, Nevada

Date: 11-03-20		Author: rnc

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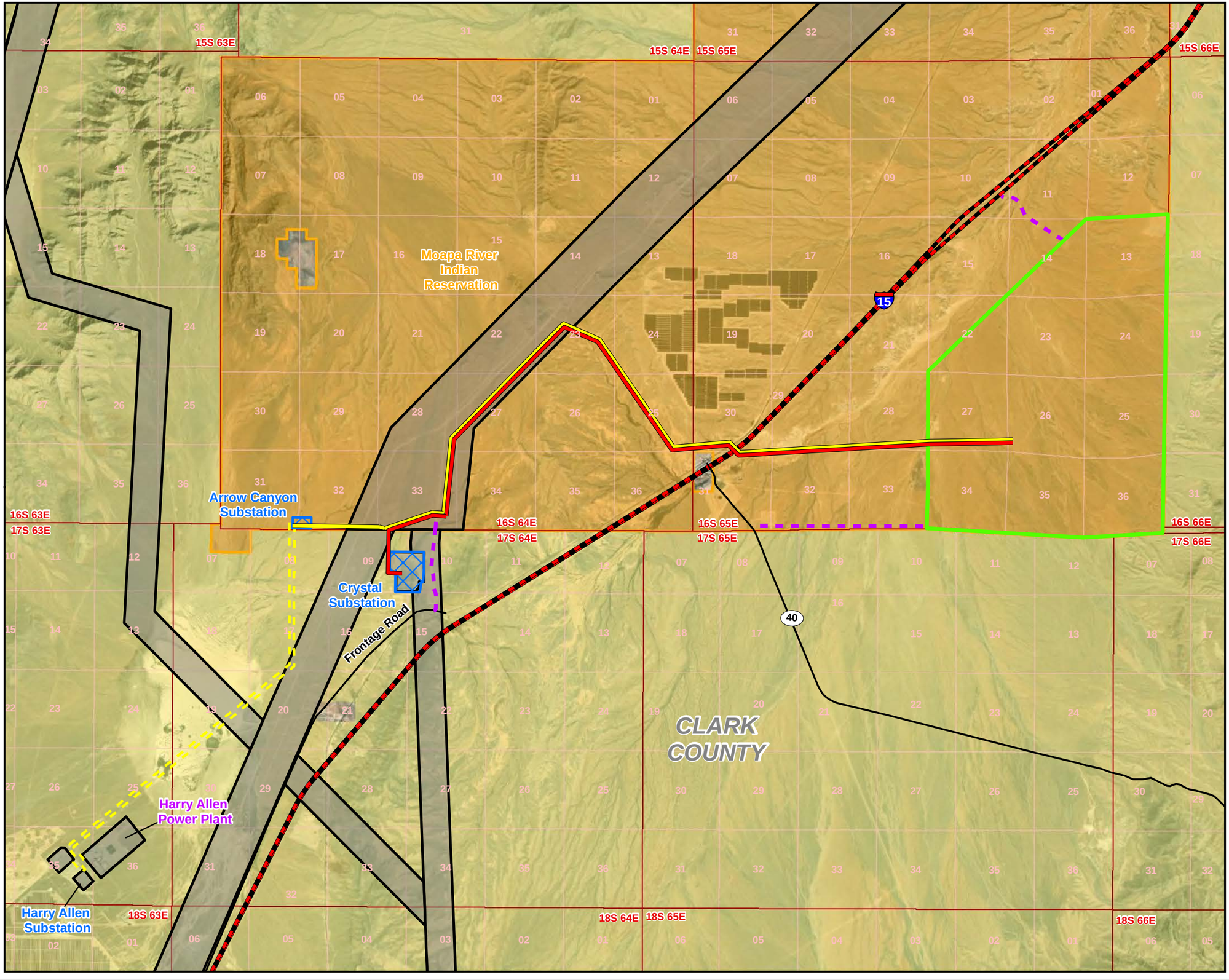

Legend

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- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

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Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

Figure 2
Project Overview Map

Map Extent: Clark County, Nevada

Date: 07-26-21		Author: rnc

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2.0 WEED SURVEYS

A weed survey of the Project sites will be completed prior to conducting surface disturbing activities. These surveys will be focused on identifying and mapping occurrences of noxious weed species described in the Nevada Revised Statues (NRS Chapter 555.010, **Appendix A**). Occurrences of cheatgrass (*Bromus tectorum*), red brome (*Bromus rubens*), halogeton (*Halogeton glomeratus*), Russian thistle (*Salsola kali*), ravennagrass (*Saccharum ravennae*), ripgut brome (*Bromus diandrus*), and Mediterranean grass (*Schismus spp.)* will also be identified and described, although these species are not listed as noxious weeds by the State of Nevada. The State of Nevada has not categorized or designated these species as noxious weeds because their distribution and occurrence are far too widespread for management efforts to successfully eradicate these species. The management efforts, described in this plan, will rely on the results of these initial weed surveys.

The results of the weed surveys will contribute to the identification of problem areas within the proposed Project sites. The weed surveys will include botanists walking parallel transects, searching for weeds on both sides of each transect. Identified weed occurrences will be described to species, assigned a ground cover rating, and individuals will be counted or estimated, as appropriate. The location of identified weed occurrences will be recorded using a hand-held global positioning system (GPS) unit and all recorded occurrences will be mapped using geographic information system (GIS) software. All identified weed occurrences will be marked in the field, either by flagging, pin flags or other means indicating to construction personnel that such areas are to be avoided until appropriately treated.

3.0 WEED MANAGEMENT

Weed management at the proposed Chuckwalla solar sites will include identification of problem areas, implementation of measures intended to prevent the spread and establishment of new weed occurrences, and application of appropriate measures to treat known occurrences of weeds. These steps toward effective weed management are described in the following sections.

3.1 Preventative Measures

The prevention of weed establishment is the most effective weed management practice. Preventing or reducing the potential for weed establishment reduces additional efforts, costs, and time invested in subsequent weed control or eradication measures. Several measures have proven to be effective toward preventing the spread and establishment of weeds on projects where surface disturbing activities are proposed. The following preventative measures will be implemented:

- Vehicles and equipment to be used on the sites will be washed with water or high-pressure air to remove residual soils or plant materials prior to gaining entry and before leaving the site (if not trucked off site). Vehicle washing efforts will concentrate on areas that are most likely to be in contact with the ground and or likely to transport weed seeds including vehicle tracks, feet, tires; vehicle under carriage, steps, running boards, bumpers, and brush guards. Washing will occur off site at existing car washes with appropriate containment facilities. Each piece of equipment will have a vehicle wash log stating the location, date and time, type of equipment used, and methods used to wash the vehicle. These logs will be verified by the environmental site monitor before vehicles enter the site.
- Vehicle cabs will be subject to cleaning in an effort to remove refuse, soil, or other materials susceptible to transporting weed seeds or other plant structures. The use of compressed air is recommended for cleaning vehicle cabs immediately prior to arriving at and departing from the site.
- All materials used during site reclamation, revegetation, and installation of stormwater/erosion control measures will be certified as weed free.
- Vehicle travel in the proposed Project areas will be restricted to designated roads and established overland travel routes.

3.2 Treatment Methods

Treatment methods are necessary to control and eradicate known weed occurrences. Treatment methods include a variety of approaches such as mechanical, chemical, and biological controls. The most appropriate and effective weed treatment measures will be determined following the assessment of existing weed populations on the proposed Project sites. The Project sites occur within suitable and occupied desert tortoise habitat. Treatment methods on Tribal lands will use the BLM's *Chemical Pest Control Manual* as a guideline for weed control.

Mechanical treatments include the use of physical means to remove plants, reproductive parts, or propagules. These treatments may entail manual methods (pulling weed plants from the soil), use of hand tools and hand-held power tools, mowing, and more aggressive efforts that involve removing above and below ground plant structures. The designation of the appropriate mechanical treatment will depend on variables including season, plant life stage, weed species, size and population of each occurrence, and more. The weed management contractor will coordinate with the appropriate agencies before implementing any weed treatment methods.

Chemical treatments involve the use and application of herbicides. The use of herbicides is highly regulated and involves a variety of specific protocols, safety measures, and precautions for eliminating, reducing, and mitigating for uncontrolled releases. The possible use of herbicides as a treatment method is described in additional detail in Section 5 of this report.

Biological treatments include the use of plants and animals (particularly insects) that parasitize, ingest, or out-compete weed species. Based on the weed species expected to occur in the Project areas and other factors, biological controls are not expected to be a viable or appropriate alternative for treating weed occurrences at the proposed site.

3.3 Agency Specific Requirements

3.3.1 Nevada Revised Statute (NRS): The Nevada Control of Insects, Pests, and Noxious Weed Act

The following section applies to federal and private lands; the BIA has the discretion to utilize existing State regulatory guidelines as appropriate.

NRS 555.150

NRS 555.150 (Eradication of Noxious Weeds by Owner or Occupant of Land) of the Nevada Revised Statute reads:

> ”*Every railroad, canal, ditch, or water company, and every person owning, controlling, or occupying lands in this State, and every county, incorporate city or district having the supervision and control over streets, alleys, lanes, rights-of-way, or other lands shall cut, destroy, or eradicate all weeds declared and designated as noxious in NRS 555.130, before such weeds propagate and spread, and whenever required by the State Quarantine Officer.”*

NRS 555.210

NRS 555.210 (Performance of Necessary Work by Weed Control Officer on Failure by Landowner Charges as Lien) of the Nevada Revised Statute reads:

> “*If any landowner fails to carry out a plan of weed control for his or her land in compliance with the regulations of the district, the weed control officer may enter upon the land affected, perform any work necessary to carry out the plan, and charge such work against the landowner. Any such charge, until paid, is a lien against the land affected coequal with a lien for unpaid general taxes, and may be enforced in the same manner.”*

4.0 WEED MONITORING

Monitoring is the repeated collection and assessment of information with the purpose of evaluating attainment of a resource management object. If management objectives are not being met, weed control measures should be scrutinized and modified to improve their effectiveness. Effective monitoring will increase the likelihood of timely detection and control of weed occurrences on the Project sites.

Weed monitoring will be conducted by qualified biologists and appropriately trained personnel. All portions of the Project areas that are proposed for surface disturbance will be monitored for weeds before construction begins and weed infestations will be mapped. Monitoring will occur when weed species are most likely to be detected and can be easily identified. New or previously unidentified weed infestations identified during monitoring will be described, their locations recorded using a hand-held GPS unit, and reported to the BIA and BLM.

4.1 Ongoing Monitoring

Weed monitoring will occur as an ongoing process during implementation of the proposed Projects. Qualified and appropriately trained personnel will use the results of the initial weed inventory to monitor known weed occurrences and will observe activity areas for opportunistic weed occurrences.

4.2 Post Construction

Weed monitoring will begin immediately following each completed activity that includes surface disturbance. Weed monitoring will occur at all disturbed sites at least twice a year (March and September) for an estimated three years or until restoration efforts are deemed complete by the Tribe and BIA. The goal of weed monitoring is to ensure no net increase in weed species or overall weed cover compared to the baseline conditions that will be mapped before construction begins. Identified weed occurrences will be noted and recorded in the same manner as was described for the weed inventory effort. A monitoring report will be submitted to the BIA and BLM following monitoring on an annual basis for three years. The report will help determine whether success criteria (e.g., no net increase in weeds) are being met. Adaptive management strategies would be implemented if necessary and could include extended weed control and monitoring past three years.

4.3 Monitoring of Known Infestation Areas

As previously mentioned, known occurrences of weed infestations will be evaluated on a regular basis. Evaluations will determine if noteworthy changes have occurred at each infestation, particularly if the number or area covered by an infestation has changed dramatically. At a minimum, annual monitoring is recommended for each known infestation. A brief summary will be prepared for each annual monitoring effort and will include sufficient detail to allow for an evaluation of the effectiveness of the weed management program, including weed infestation identification, weed monitoring, and weed control.

5.0 HERBICIDE APPLICATION, HANDLING, SPILLS, AND CLEANUP

5.1 Herbicide Application

Weed management contractors/personnel that are responsible for applying herbicides will obtain all of the required Federal, State, or local agency permits and will hold all necessary certifications and have received all relevant training. In general, guidelines in BLM's Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (BLM 2007) would be implemented. Permits may include terms and conditions that are not included in this WMP. A licensed contractor will apply herbicides in accordance with all applicable laws, regulations, and permit stipulation, including U.S. Environmental Protection Agency (EPA) label instructions. If faced with any of the following scenarios, herbicide application shall be suspended until such conditions no longer exist:

- Wind velocities in excess of 6 miles per hour (mph) during application of liquid herbicides and 15 mph during application of dry herbicides;
- Snow or ice present on weed foliage; or
- Precipitation is occurring or imminent.

For weed infestations readily accessible and passable by vehicle, vehicle-mounted applicators will be used. Manual application methods will be used in weed occurrences that are relatively small, inaccessible by established road, or in rough, varied terrain. All herbicide applicators, spreaders and sprayers, will be calibrated before each use to ensure all applications rates and procedures are appropriately implemented.

Herbicide transport and handling will follow these methods:

- No herbicides will be stored onsite.
- Only the quantity of herbicide expected for each day's use will be transported.
- Herbicide concentrate will be transported in approved containers in a controlled manner that prevents spills. Concentrate will be positioned in delivery or work vehicles so as to be secured and separated from the driving compartment, food, clothing, and safety equipment.
- The mixing of herbicide materials will be conducted at an offsite location or within a controlled space in the Operations and Management Area that is designated onsite. All mixing will take place over a drip/spill containment device and at a distance more than 200 feet from open or flowing water, wetlands, or other sensitive resources.
- Herbicides will not be applied to areas of open or flowing water, wetlands, or other sensitive resources unless authorized by the appropriate regulatory agency.
- All equipment and containers used for herbicide storage, application, and transport will be subject to inspection for leaks or damage.
- Emptied herbicide containers will be disposed of in accordance with instructions provided on the label.

5.2 Herbicide Spills and Cleanup

All spills and inadvertent releases of herbicides will be addressed immediately upon detection. Spill response kits approved for the correct spill size will be readily available in herbicide contractor vehicles and in daily onsite herbicide storage areas.

Spill response will vary depending on a variety of conditions, including location, amount of spill, area impacted by spill, type of herbicide spilled, and more. For each spill the following procedures should be implemented:

- Notify appropriate onsite personnel and agencies of a spill.
- Secure the affected area by barring pedestrian and vehicle traffic.
- All spill response personnel shall don the appropriate personal protective equipment (PPE) prior to entering the spill containment area.
- Personnel, while wearing the appropriate PPE and equipped with the necessary tools and equipment, shall stop the herbicide leak or release.
- All materials associated with spill response, including the released herbicide, affected soils and plants, absorptive material, clothing, and PPE shall be removed and containerized according to appropriate regulations and procedures.

All containers generated during a spill response shall be transported, following appropriate regulations, and disposed legally at an approved disposal facility.

5.3 Worker Safety and Spill Reporting

All contractors responsible for herbicide use, transport, application, and control at the sites will hold the appropriate certifications. Such certifications shall be made available. Contractors transporting herbicides to the site shall also have legible material safety data sheets (MSDSs) and labels onsite. All herbicide spills and inadvertent releases shall be reported in accordance with all applicable laws and regulations.

6.0 REFERENCES

BLM. 2007. Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement. Available on the internet at: https://eplanning.blm.gov/eplfrontoffice/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=103592.

State of Nevada. 2005. Nevada Revised Statutes Chapter 555 – Control of Insects, Pests, and Noxious Weeds. Accessed at: https://www.leg.state.nv.us/NAC/NAC-555.html#NAC555Sec005

Appendix A –Nevada Designated Noxious Weed Species

Table A-1: Designated Noxious Weed Species of the State of Nevada

Common Name	Scientific *Name*	State of Nevada Category
African rue	*Peganum harmala*	A
Austrian fieldcress	*Rorippa austriaca*	A
Black henbane	*Hyoscyamus niger*	A
Camelthorn	*Alhagi psedualhagi*	A
Common crupina	*Crupina vulgaris*	A
Common St. Johnswort	*Hypericum perforatum*	A
Crimson fountaingrass	*Pennisetum setaceum*	A
Dalmation toadflax	*Linaria dalmatica*	A
Dyer's woad	*Isatis tinctoria*	A
Eurasian water-milfoil	*Myriophyllum spicatum*	A
Giant reed	*Arundo donax*	A
Giant salvinia	*Salvinia molesta*	A
Goatsrue	*Galega officinalis*	A
Houndstongue	*Cynoglossum officinale*	A
Hydrilla	*Hydrilla verticillata*	A
Iberian starthistle	*Centaurea iberica*	A
Malta starthistle	*Centaurea melitensis*	A
Mayweed chamomile	*Anthemis cotula*	A
Mediterranean sage	*Salvia aethiopis*	A
Purple loosestrife	*Lythrum salicaria, L. virgatum*	A
Purple starthistle	*Centaurea calcitrapa*	A
Rush skeletonweed	*Chondrilla juncea*	A
Sow thistle	*Sonchus arvensis*	A
Spotted knapweed	*Centaurea masculosa*	A
Squarrose knapweed	*Centaurea virgate var. squarrosa*	A
Sulfur cinquefoil	*Potentilla recta*	A
Swainsonpea	*Sphaerophysa salsula*	A
Syrian bean caper	*Zygophyllum fabago*	A
Yellow starthistle	*Centaurea solstiltialis*	A
Yellow toadflax	*Linaria vulgaris*	A
Horsenettle	*Solanum carolinense*	B
Diffuse knapweed	*Centaurea diffusa*	B
Leafy spurge	*Euphorbia esula*	B
Medusahead	*Taeniatherum caput-medusae*	B
Musk thistle	*Carduus nutans*	B
Russian knapweed	*Acroptilon repens*	B
African mustard	*Brassica tournefortii*	B
Scotch thistle	*Onopordum acanthium*	B
Silverleaf nightshade	*Solanum elaegnifolium*	B
Canada thistle	*Cirsium arvense*	C

Common Name	Scientific *Name*	State of Nevada Category
Hoary cress	*Cardaria draba*	C
Johnson grass	*Sorghum halepense*	C
Perennial pepperweed	*Lepidium latifolium*	C
Poison-hemlock	*Conium maculatum*	C
Puncture vine	*Tribulus terrestris*	C
Salt cedar (tamarisk)	*Tamarix spp.*	C
Spotted water hemlock	*Cicuta maculate*	C

A: Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated where found; control required by the state in all infestations.
B: Weeds established in scattered populations in some counties of the state; actively excluded where possible; control required by the state in areas where populations are not well established or previously unknown to occur.
C: Weeds currently established and generally widespread in many counties of the state; abatement at the discretion of the State Quarantine Office.

Appendix G

Decommissioning Plan

DRAFT CONCEPTUAL DECOMMISSIONING PLAN

Chuckwalla Solar Projects

December 2021

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Tables

Figures

Acronyms Used in the Report

BESS	Battery Energy Storage System
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
NEPA	National Environmental Policy Act
O&M	Operations and Maintenance
PV	Photovoltaic
PPA	Power Purchase Agreement
RCRA	Resource Conservation and Recovery Act
Reservation	Moapa River Indian Reservation
SPGF	Solar Power Generation Facility
TSCA	Toxic Substances Control Act

1.0 INTRODUCTION

EDF Renewables Development, Inc. (EDFR, Applicant) has entered into an option agreement with the Moapa Band of Paiute Indians (Moapa Band or Band) to lease up to 6,500 acres for the development of up to four solar projects collectively referred to as the Chuckwalla Solar Projects (Chuckwalla Projects or Projects) to be located on the Moapa River Indian Reservation (Reservation) in Clark County, Nevada. The four solar projects would total up to 700 megawatts (MWs) of solar energy generation each using photovoltaic (PV) technology and incorporating battery energy storage systems (BESS). The Chuckwalla Projects would include the four solar projects and all associated facilities. The Bureau of Indian Affairs (BIA), as lead agency in cooperation with the Moapa Band of Paiute Indians (Moapa Band), and other agencies, intends to prepare an Environmental Impact Statement (EIS) that will evaluate the Projects.

The proposed Chuckwalla solar generating facilities would be constructed entirely within the Reservation within a lease study area of approximately 6,500 acres of tribal trust land. These lands are all located in the southeast corner of the Reservation in an area set aside by the Band exclusively for the Chuckwalla Projects. The solar fields and associated facilities would be in Sections 13, 14, 22, 23, 24, 25, 26, 27, 34, 35, and 36; Township 16 South, Range 65 East; Mount Diablo Base Meridian. **Figure 1** shows the proposed general location for the Projects.

Primary access to the Chuckwalla sites would be provided from the Valley of Fire Highway via an existing 2.5-mile road on the Reservation that parallels its southern border and would be upgraded, as needed. Additional access to the northern portion of the lease area would be provided via another existing road on the Reservation. **Figure 2** shows the locations of the proposed gen-tie lines and access roads.

The water supply required for the Projects would be provided by the Moapa Band and drawn from the Moapa Band's existing water rights. The water would be provided from either existing tribal wells or a new well on the Reservation within the lease area. If the water is sourced from off-site wells, it could be delivered to the sites via pipeline or truck.

1.1 Purpose of the Decommissioning Plan

The purpose of this Decommissioning Plan is to establish the conceptual methodologies that would be employed for decommissioning activities associated with the permanent closure of the Projects. The actual actions implemented in the facility closure would be determined by the expected future use of the sites. Therefore, a more detailed decommissioning plan would be developed in advance of the start of decommissioning activities.

The Projects are expected to operate at a minimum for the life of its lease with the Tribe and the term of its Power Purchase Agreement (PPA) or other energy contracts. It is possible, because much of the needed electrical infrastructure will have been developed, the Solar Power Generation Facilities (SPGF) would continue to be upgraded and used to generate solar energy even beyond the term of the initial lease and energy purchase agreements. Therefore, it is possible that the SPGF sites would remain in solar energy production for the foreseeable future.

It is also possible that the Tribe could re-purpose the Project sites at the termination of the solar Projects. Certain facility components such as the access road, electrical transmission lines, Operations and Maintenance (O&M) building, and others could be used to support other future uses on the sites.

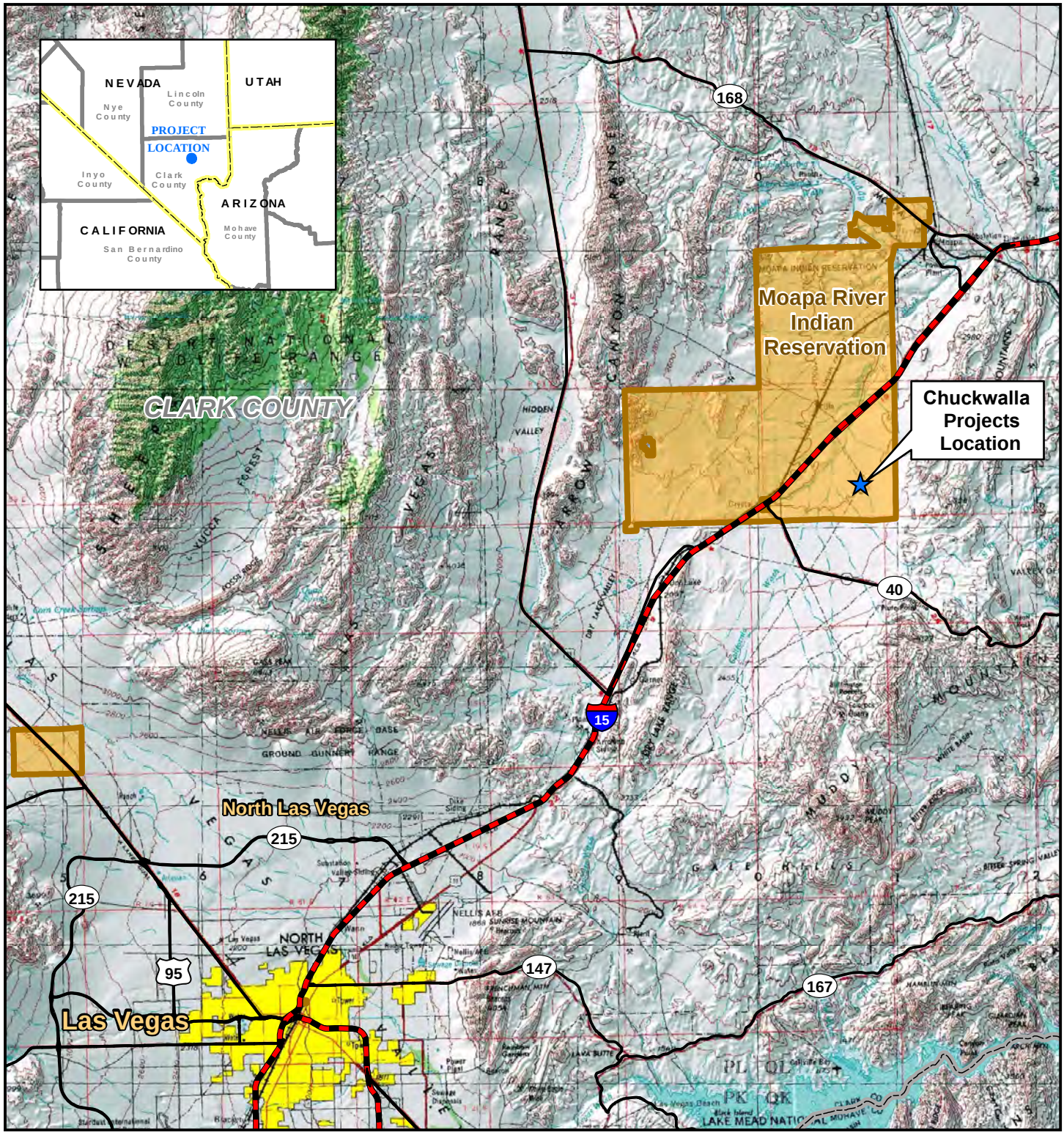
For purposes of developing this plan, it is assumed that if and when the Projects are decommissioned, all project structures and electrical equipment would be removed from the sites and associated rights-of way (ROWs) and the disturbed areas would be reclaimed in accordance with the Restoration and Revegetation Plan(s).

1.2 Organization of the Plan

This conceptual decommissioning plan addresses the following:

- Project Description
- Regulatory Criteria
- Decommissioning Activities
    - Pre-Decommissioning
    - Removal of Facilities
    - Hazardous Waste Management
    - Debris Management, Disposal, and Recycling
    - Post-Demolition Site Stabilization
- Project Decommissioning Costs and Bonding

As mentioned earlier, because this document addresses Project actions that would occur well in the future, it will be updated and finalized in the months prior to any scheduled decommissioning to ensure that the final plan addresses the proposed future land use of the sites and the applicable rules and regulations in place at that time.



Legend

- Solar Project Location
- Interstate
- US/ State Highway
- Railroad

Jurisdictional Land Ownership

- Indian Reservation

0 2 4 6 8 10

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

FIGURE 1
General Location

Map Extent: Clark County, Nevada

Date: 11-03-20		Author: rnc

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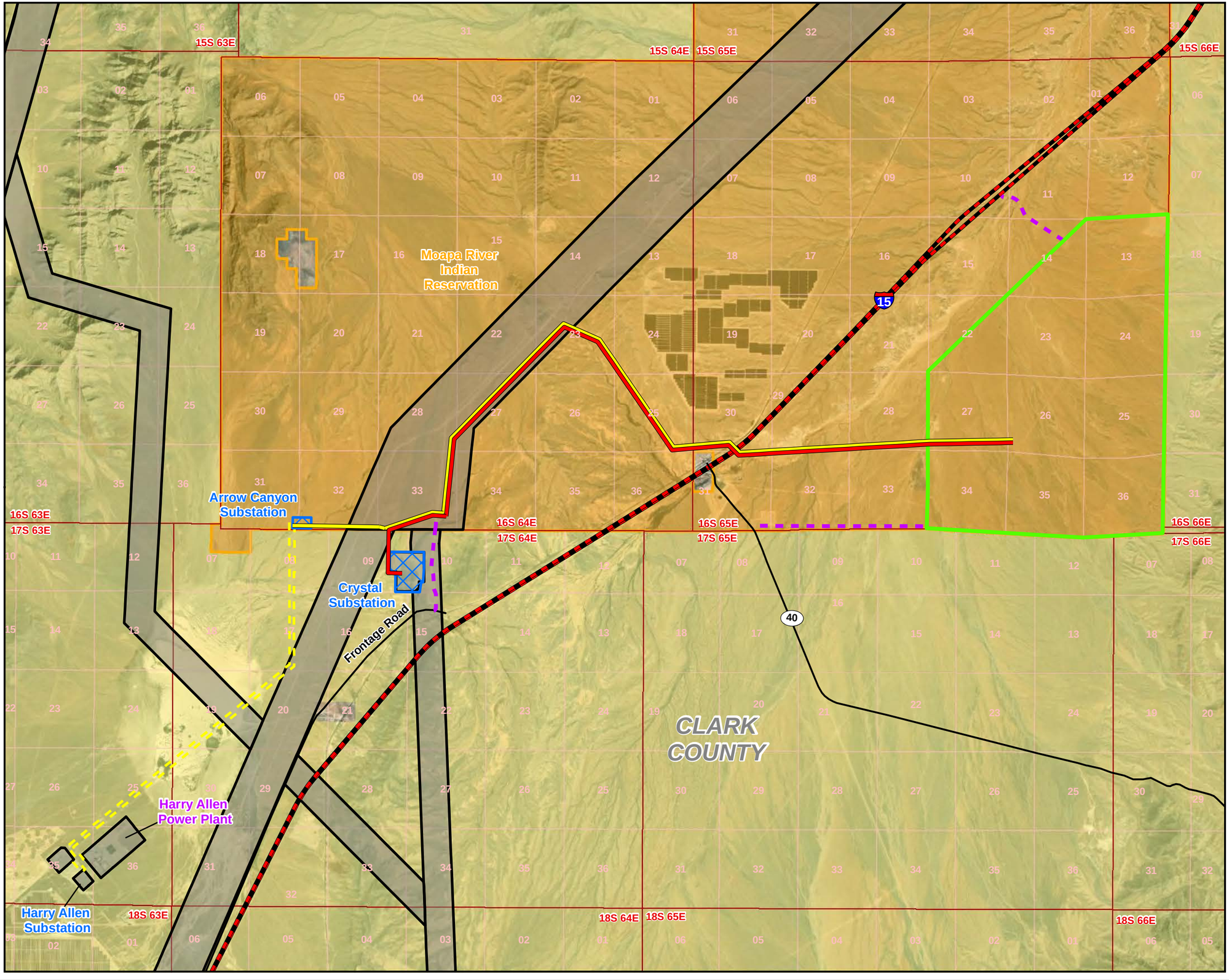


Legend

Project Components

- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Approved ROW Arrow Canyon - Harry Allen

General Features

- Interstate
- Major Highway
- Railroad
- Stream / River
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 0.5 1 1.5

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

Figure 2
Project Overview Map

Map Extent: Clark County, Nevada

Date: 07-26-21		Author: rnc

G:\MXD's\Project Location_072621.mxd

2.0 PROJECT DESCRIPTION

The following describes the major features of the proposed Projects. For a comprehensive description of the proposed Projects, refer to the associated Chuckwalla Solar Projects Draft Environmental Impact Statement (DEIS) for the Project design details (subject to minor design changes).

2.1 Proposed Solar Project Components

The solar fields for the Chuckwalla Projects would be located wholly on lands within the Reservation. They would be developed using PV solar technology to generate up to 700 MWs of solar energy for four separate projects summarized in **Table 2-1** below:

Table 0-1
Summary of Proposed Chuckwalla Solar Projects

Project	Energy Output (MW – megawatt)	Lease Study Area
Chuckwalla 1a	200 MW	1,976
Shared Facilities Area	N/A	166
Chuckwalla 1b	50 MW	480
Chuckwalla 2	200 MW	1,572
Chuckwalla 3	250 MW	2,307

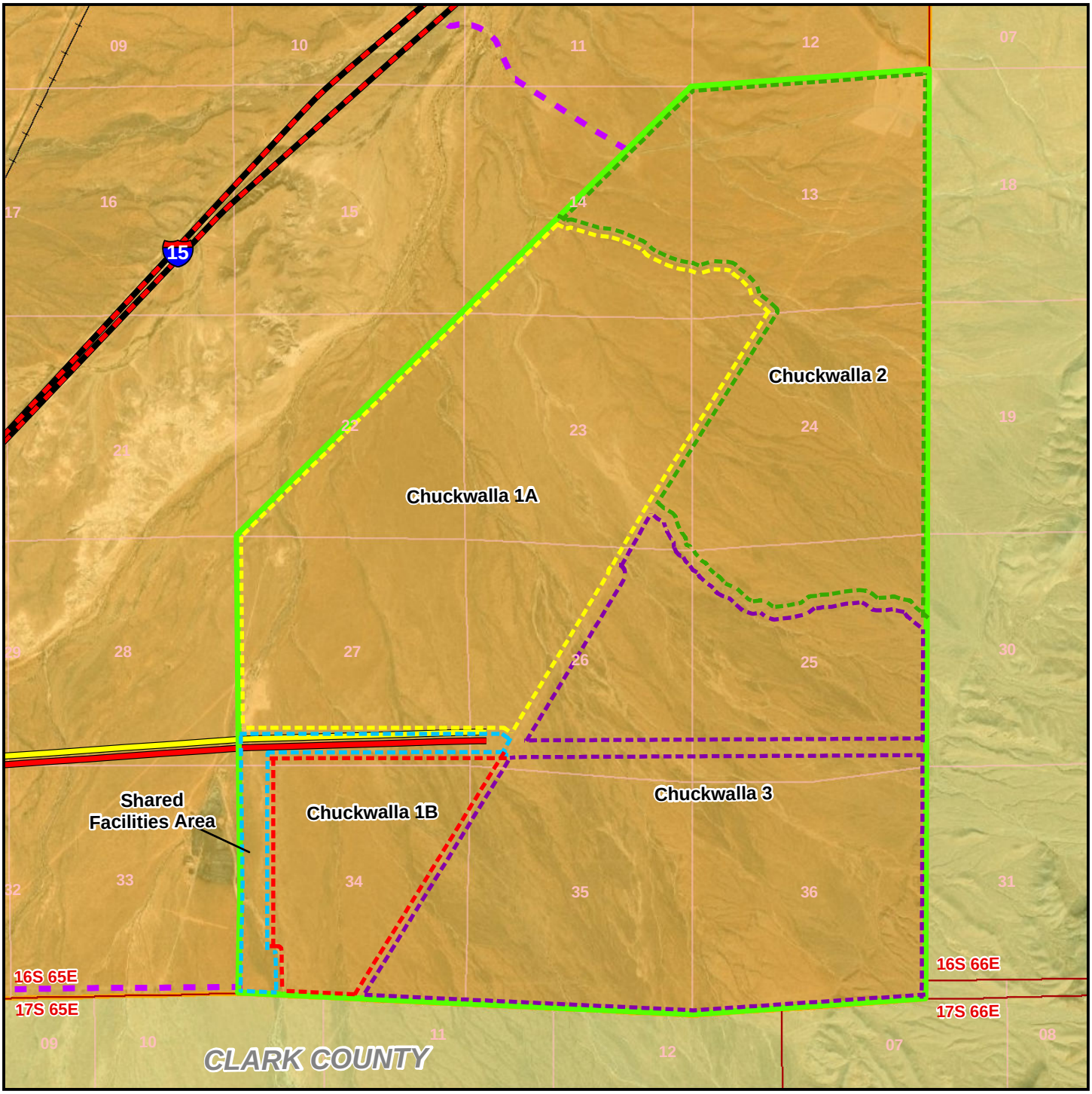
Figure 3 shows the proposed locations of the lease study areas for each of the four proposed Projects. Chuckwalla 1a and 1b would be built at the same time to make up the first phase of the Projects. Chuckwalla 2 and 3 would be built separately in subsequent phases. In addition to the lease areas for each project, the four projects would collectively utilize a Shared Facilities Area of approximately 165 acres containing BESS facilities, operations and maintenance (O&M) facilities, helipad, site substations, laydown areas, batch plant, and a temporary water pond / water tank that would be utilized by all four projects.

The Projects would include the following onsite key elements located within the up to 6,500-acre solar lease boundary. Onsite facilities would impact only a portion of the 6,500-acre lease area and would include:

- Solar Fields
- Battery Energy Storage System (BESS)
- Onsite Electrical Collection System and Site Substations
- Site Security and Fencing
- Communication Systems Infrastructure
- Operations and Maintenance Area
- Internal Site Roads
- Lighting
- Water Supply
- Wastewater Treatment
- Waste and Hazardous Materials Management
- Fire Protection Systems

Permanent disturbance areas would include piles, inverters/transformers, O&M area, substation, BESS, solar site roads within and between solar arrays, and drainage features. Temporary

disturbance areas would include those portions of the solar field that are not graded, mowed to 18 inches and crushed, and laydown areas.



Legend

- Chuckwalla Solar Lease Area
- Chuckwalla 1A
- Chuckwalla 1B
- Chuckwalla 2
- Chuckwalla 3
- Shared Facilities Area
- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Interstate
- Railroad
- Township
- Section
- Jurisdictional Land Ownership
- Indian Reservation
- Bureau of Land Management Land

Chuckwalla Solar Project

Figure 3
Solar Project Lease Areas

Map Extent: Clark County, Nevada

Date: 12-22-21		Author: rnc

G:\Chuckwalla Solar Project/MXD's/Project Location 8.5x11 122221.mxd

0 0.25 0.5
Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

2.2 Off-Site Rights-of-Way

The primary off-site ancillary facilities needed to support the Chuckwalla Projects include two gen-tie lines, two access roads, and a temporary water pipeline. The locations of these facilities are shown in **Figure 2**. The off-site facilities would include the following key elements located on Tribal lands, within the BLM-managed designated utility corridor on Tribal lands and a short distance on BLM-administered lands. Off-site facilities would include:

Gen-tie Transmission Lines

Site Access Roads

Water Pipeline

Site Security and Fencing

3.0 REGULATORY CRITERIA

During the decommissioning process, all activities will be conducted in compliance with all applicable Federal and Tribal regulations in place at the time. Consultation with the Tribe, BIA, BLM and any other involved entities would be conducted to ensure that all Federal and Tribal requirements are addressed. The primary guidance documents for decommissioning will be the Final Decommissioning Plan (prepared just in advance of project closure) and the Restoration and Revegetation Plan.

Federal requirements involving hazardous wastes and toxic substances will also be followed during decommissioning activities. Among these are the Toxic Substances Control Act (TSCA) (15 U.S.C. §2601) that requires reporting, record-keeping and testing requirements and restrictions relating to the use and disposal of chemical substances and/or mixtures. TSCA also addresses the production, importation, use and disposal of specific chemicals (EPA 2019a). The Resource Conservation and Recovery Act (RCRA) (42 U.S.C. §6901) gives the EPA the authority to control hazardous waste from its generation till disposal, also including transportation, treatment, and storage (EPA 2019b).

Coordination with the Tribe and agencies throughout the life of the Projects, including decommissioning, is critical so that applicable regulations are not violated and the public and the environment are not impacted by the Projects.

4.0 PROJECT DECOMMISSIONING

The procedures described for decommissioning are designed to promote public health and safety, environmental protection and compliance with applicable regulations. It is assumed that decommissioning will begin approximately 30 or more years after Project operation is initiated. The Projects plan to incorporate the sale of some of the facility components via the used equipment market and recycling of components, where feasible. Decommissioning will be conducted in accordance with a Final Decommissioning Plan that will be developed in the months prior to decommissioning being initiated. This decommissioning plan assumes that all equipment and facilities within and associated with the SPGF would be removed.

4.1 Pre-Decommissioning Activities

Pre-decommissioning activities will be conducted to prepare the Projects for demolition. This would include assessing the existing site conditions, itemizing relevant NEPA and Biological Opinion (BO) requirements, and development of the final Decommissioning Plan and schedule, as described above.

An Environmental Site Assessment (ESA) will be conducted before any decommissioning activities occur. The ESA will document the existing conditions of the SPGF including the location and presence of hazardous materials on the sites. The results of the ESA will be used to define any remediation or cleanup methodologies that could be required and incorporated into the Final Decommissioning Plan. This documentation would ensure that areas containing hazardous materials can be decommissioned appropriately.

Other pre-decommissioning activities would include removing hazardous materials from the sites, including residues that occur in equipment. All operational liquids and chemicals are expected to be removed and disposed of, as discussed in Section 4.4. Hazardous material and petroleum containers, pipelines, and other similar structures shall be rinsed clean, when feasible, and the waste liquid collected for off-site disposal. Locations for decommissioned structures, non-hazardous waste, and debris will be designated in the final decommissioning plan to facilitate the decommissioning process and off-site removal.

4.2 Removal of Facilities

Site decommissioning and equipment removal can take a year or more. Therefore, access roads, fencing, electrical power, and raw/sanitary water facilities will remain in place for use by the decommissioning and restoration workers until no longer needed; these components would be the last to be removed prior to site rehabilitation, unless otherwise requested to maintain by the Band.

4.2.1 SPGF Above- and Below-Ground Facilities

Structures to be dismantled during decommissioning include the on-site substation, on-site O&M area, perimeter fence, solar field, BESS, water storage tanks, septic system, underground cabling, transformers and inverters. These structures will be dismantled and moved to designated areas for either recycling, disposal at an approved landfill, or other disposition (e.g., resale).

Above-ground structures will be removed through mechanical or other approved methods. Below-ground structures will be removed or, upon agency approval, may remain in place to minimize soil disturbance. Below-ground facilities/utilities that potentially may be removed include pipelines, electrical lines and conduits, gas lines, concrete slabs.

4.2.2 Roads

On-site roads will remain in place to accomplish decommissioning at the end of the facility's life and would be one of the last components of the Projects to be removed. Following removal, on-site roads will be restored to approximate preconstruction conditions in accordance with the Restoration and Revegetation Plan.

4.3 Debris Management, Disposal, and Recycling

All removed material and demolition debris will be placed in designated locations within the SPGF site. Each stockpile will be transported off-site to either a used equipment market, off-site recycling center, or approved landfill depending on the material type. Debris will be broken down into manageable sizes so that transportation is simplified.

4.4 Hazardous Waste Management

All disposal and transportation of hazardous waste will be conducted in compliance with RCRA (42 U.S.C. §6901), and TSCA (15 U.S.C. §2601), and other regulations, as needed. In areas where no record of hazardous waste exposure occurred, a visual inspection would be conducted as part of the pre-decommissioning ESA, described in **Section 4.1**. If a concern is identified, further evaluation of the area shall occur and the area or structure will be treated accordingly. A licensed state waste contractor would be used to ensure that all required laws and regulations have been met and to address any remaining requirements needed to successfully close the Projects.

4.5 Post-Demolition Site Stabilization

After all removal of existing structures of the SPGF and ancillary facilities, the Project areas will be restored to conditions similar to pre-construction. Then, revegetation and reclamation activities required to return the disturbed areas to an as near to a pre-construction state as possible will be conducted in accordance with the plans prepared as part of the Projects. These plans include:

- Site Restoration Plan
- Integrated Weed Management Plan

The objectives of these plans include the following:

- Restore and reduce potential for erosion
- Restore habitat suitable to support desert fauna
- Implement the weed management program that minimizes the need for non-native species eradication.

5.0 PROJECT DECOMMISSIONING COSTS AND BONDING

Prior to the issuance of the notice to proceed for the Projects, the Applicant will be required to provide performance and reclamation bonding in an amount sufficient to ensure the implementation of the approved Decommissioning Plan for restoration and performance.

The bond instrument will be based on a decommissioning cost estimate provided by the Applicant and based on the final design of the Projects. This estimate will consider any components of the Projects that are expected to be left in place at the request of and for the benefit to the Tribe or BLM. The decommissioning, performance, and reclamation estimate will also include the residual value of any salvageable or recyclable property, as well as the then-current cost of decommissioning.

6.0 REFERENCES

United States Environmental Protection Agency (EPA). 2019a. Summary of the Toxic Substances Control Act. https://www.epa.gov/laws-regulations/summary-toxic-substances-control-act

United States Environmental Protection Agency (EPA). 2019b. Summary of the Resource Conservation and Recovery Act. https://www.epa.gov/laws-regulations/summary-resource-conservation-and-recovery-act

Appendix H

Bird and Bat Conservation Strategy

Chuckwalla Solar Projects

Bird and Bat Conservation Strategy

December 2021

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Appendices

1 Introduction

This Bird and Bat Conservation Strategy (BBCS) is a voluntary, project-specific document that outlines a plan to reduce the risks that result from bird and bat interactions with components of the Chuckwalla Solar Projects (Chuckwalla Projects or the "Projects"). The goal of this, and any, BBCS is to reduce bird and bat mortality (USFWS 2012). The statutory authority for addressing effects to birds stems primarily from the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act (BGEPA), as well as the Endangered Species Act (ESA); for bats, the United States Fish and Wildlife Service's (USFWS) statutory authority arises primarily from the ESA (USFWS 2010a).

1.1 Purpose

This BBCS has been prepared to outline Project- specific practices and measures for reducing avian and bat impacts potentially resulting from construction and operation of the Projects. Two of the greatest concerns with respect to the Projects are the potential for avian and, to a lesser degree, bat collision with Project components such as solar panels or utility lines, as well as the permanent loss of golden eagle (*Aquila chrysaetos*) foraging habitat.

1.2 Goals

Implementation of this BBCS would fulfill multiple goals in an effort to reduce avian and bat mortality throughout construction, operation and maintenance of the Projects. The goals specific to this BBCS are to:

1. Identify and isolate where avian and bat mortality has the potential to occur and reduce the potential for avian and bat mortality by implementing specific mortality reduction actions;
2. Design Project utility lines to be raptor safe in accordance with Avian Power Line Interaction Committee (APLIC) design standards (APLIC 2006, 2012), including ensuring that electrified systems do not present an electrocution risk and minimizing the risk of collisions with associated infrastructure;
3. Conduct preconstruction surveys to avoid impacts to nesting birds;
4. Establish an avian and bat reporting system to document incidents of electrocution and collision mortality during construction and operations.

2 Laws, Regulations, and Cultural Traditions

Native birds and bats in Nevada are protected primarily under three pieces of legislation: the ESA, MBTA, and BGEPA. The Moapa Band of Paiutes (Tribe) does not have tribal guidance or regulations concerning birds and bats within the Moapa River Indian Reservation (Reservation) where the Proposed Projects are located.

2.1 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (16 US Code [U.S.C.] §§ 703-712) is administered by the USFWS (USFWS 1998a) and is the cornerstone of migratory bird conservation and protection in the U.S. The Act authorizes the Secretary of the Interior to regulate the taking of migratory birds; and provides that it shall be unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird" (16 U.S.C. § 703). The list of species protected by the Act was revised in 2013 and includes almost all bird species that are native to the U.S.

2.2 Endangered Species Act

Section 9 of the ESA prohibits everyone, private person and federal agency alike, from "taking" endangered and threatened wildlife. "Take" is defined as: to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct (16 U.S.C. § 1532(19)). "Harm" is further defined by USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. "Harass" is defined by USFWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering (USFWS 1998b). Any activity that may result in the "incidental take" of threatened or endangered species requires permission from the USFWS under ESA Sections 7 or 10.

2.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act of 1940 (as amended 1959, 1962, 1972, and 1978) prohibits the take, disturbance, or possession of bald and golden eagles with limited exceptions. Take, in the Act, is defined as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" (16 U.S. Code § 668c). Disturb is defined in USFWS regulations as, "to agitate or bother a bald or golden eagle to a degree that causes or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding or sheltering behavior" (50 C.F.R. § 22.3). Important eagle-use areas include eagle nests, foraging areas, or roost sites that eagles rely on for breeding, sheltering, or feeding, and the surrounding landscape features, foraging areas, or roost sites that are essential for the continued viability of the site for breeding, feeding, or sheltering eagles.

3 Proposed Project

3.1 Project Area and Description

EDF Renewables Development, Inc. (EDFR) has entered into an option agreement with the Moapa Band of Paiute Indians (Moapa Band or Band) to lease up to 6,500 acres for the development of up to four solar projects collectively referred to as the Chuckwalla Solar Projects (Chuckwalla Projects or Projects) to be located on the Moapa River Indian Reservation (Reservation) in Clark County, Nevada. The four solar projects would total up to 700 megawatts (MWs) of solar energy generation each using photovoltaic (PV) technology and incorporating battery energy storage systems (BESS). The Chuckwalla Projects would include the four solar projects and all associated facilities. **Figure 1** shows the proposed general location for the Chuckwalla Solar Projects approximately 30 miles northeast of Las Vegas and east of Interstate 15 (I-15). **Figure 2** shows the general boundaries for the four Projects.

The Projects would include two new generation interconnection (gen-tie) lines approximately 10 to 12 miles long that would interconnect the solar projects to the regional electrical grid – one to the existing Harry Allen substation (via the approved Moapa Solar Energy Center [MSEC] line) and one directly to the existing Crystal Substation. Portions of these gen-tie lines would cross lands managed by the Bureau of Land Management (BLM) – both within a federally designated utility corridor on the Reservation and federal lands south of the Reservation. The Crystal Substation is part of the Navajo Transmission System, which is partially owned by the United States (U.S.) Government with oversight from the Bureau of Reclamation (Reclamation).

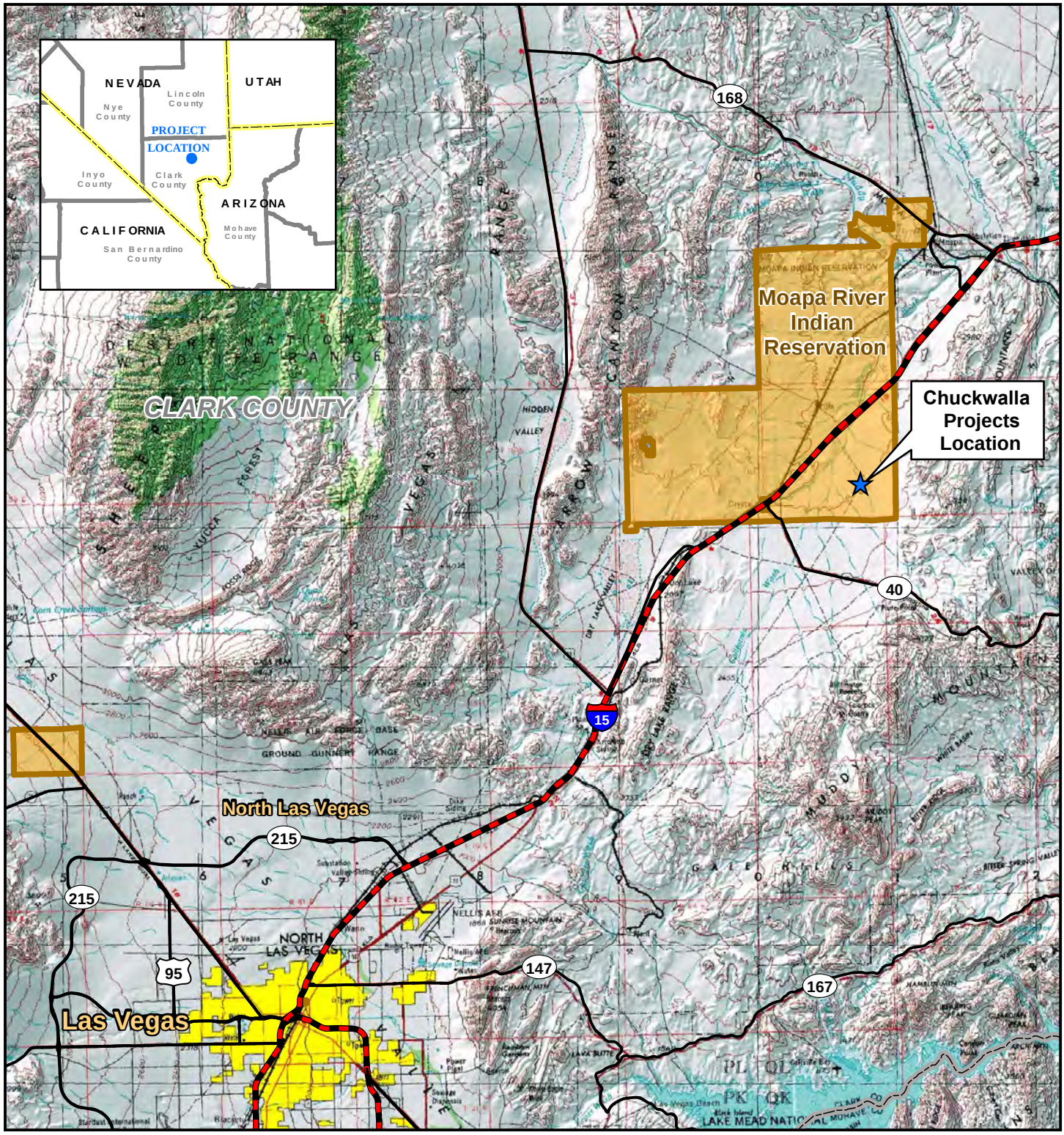
Primary access to the Chuckwalla sites would be provided from the Valley of Fire Highway via an existing 2.5-mile road on the Reservation that parallels its southern border and would be upgraded as needed. Additional access to the northern portion of the lease area would be provided via another existing road on the Reservation. **Figure 3** shows the locations of the proposed gen-tie lines and access roads.

The water supply required for the Projects would be provided by the Moapa Band and drawn from the Moapa Band's existing water rights. The water would be provided from either existing tribal wells or a new well on the Reservation within the lease area. If the water is sourced from off-site wells, it could be delivered to the site via pipeline or truck.

The Projects are located in the Basin and Range physiographic province in the north central portion of the Mojave Desert. Basin and Range structure in the Mojave Desert is characterized by abrupt mountain ranges, generally of moderate height. The Project sites are situated in the northern Dry Lake Valley. The sites consist primarily of low-profile bajada slopes and ephemeral washes, which drain to Dry Lake, a closed basin playa.

The general ecological setting of the Projects is Mojave Desert scrub. The area is dominated by open stands of creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) with other associated species. Xeroriparian habitats are characterized by three sub-groups: creosote-white bursage, catclaw acacia (*Acacia greggii*) and big galleta grass (*Pleuraphis rigida*). Mojave yucca scrub and disturbed habitats are also present. A more detailed description of the Project Area can be found in the Draft Environmental Impact Statement (DEIS) for the Projects.

The Project facilities are anticipated to disturb up to 6,500 acres on Reservation land. Most of the Project Area will be mowed to a height of approximately 18 inches and drive and crush construction techniques would be implemented in order to retain as much native vegetation as possible. All disturbance would occur on the Reservation, except for the short portion of the gen-tie and potential substation near the existing Crystal substation on BLM-administered land. The Project location allows efficient connection of the energy from solar resources to existing transmission infrastructure.



Legend

- Solar Project Location
- Interstate
- US/ State Highway
- Railroad

Jurisdictional Land Ownership

- Indian Reservation

0 2 4 6 8 10

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

FIGURE 1
General Location

Map Extent: Clark County, Nevada

Date: 11-03-20		Author: rnc

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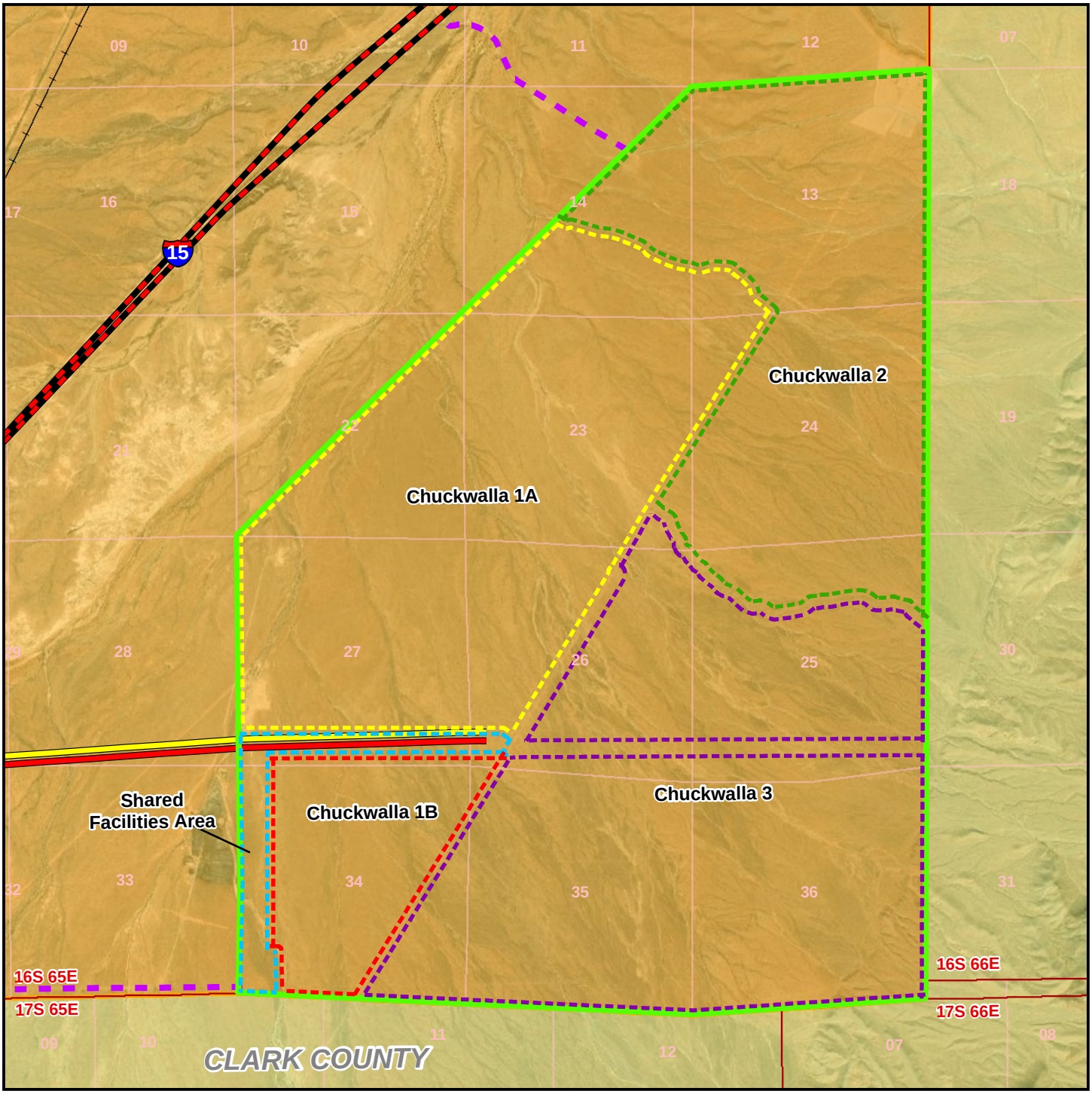

Legend

- Chuckwalla Solar Lease Area
- Chuckwalla 1A
- Chuckwalla 1B
- Chuckwalla 2
- Chuckwalla 3
- Shared Facilities Area
- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Interstate
- Railroad
- Township
- Section
- Jurisdictional Land Ownership
- Indian Reservation
- Bureau of Land Management Land

Chuckwalla Solar Project

Figure 2
Solar Project Lease Areas

Map Extent: Clark County, Nevada

Date: 12-22-21		Author: rnc

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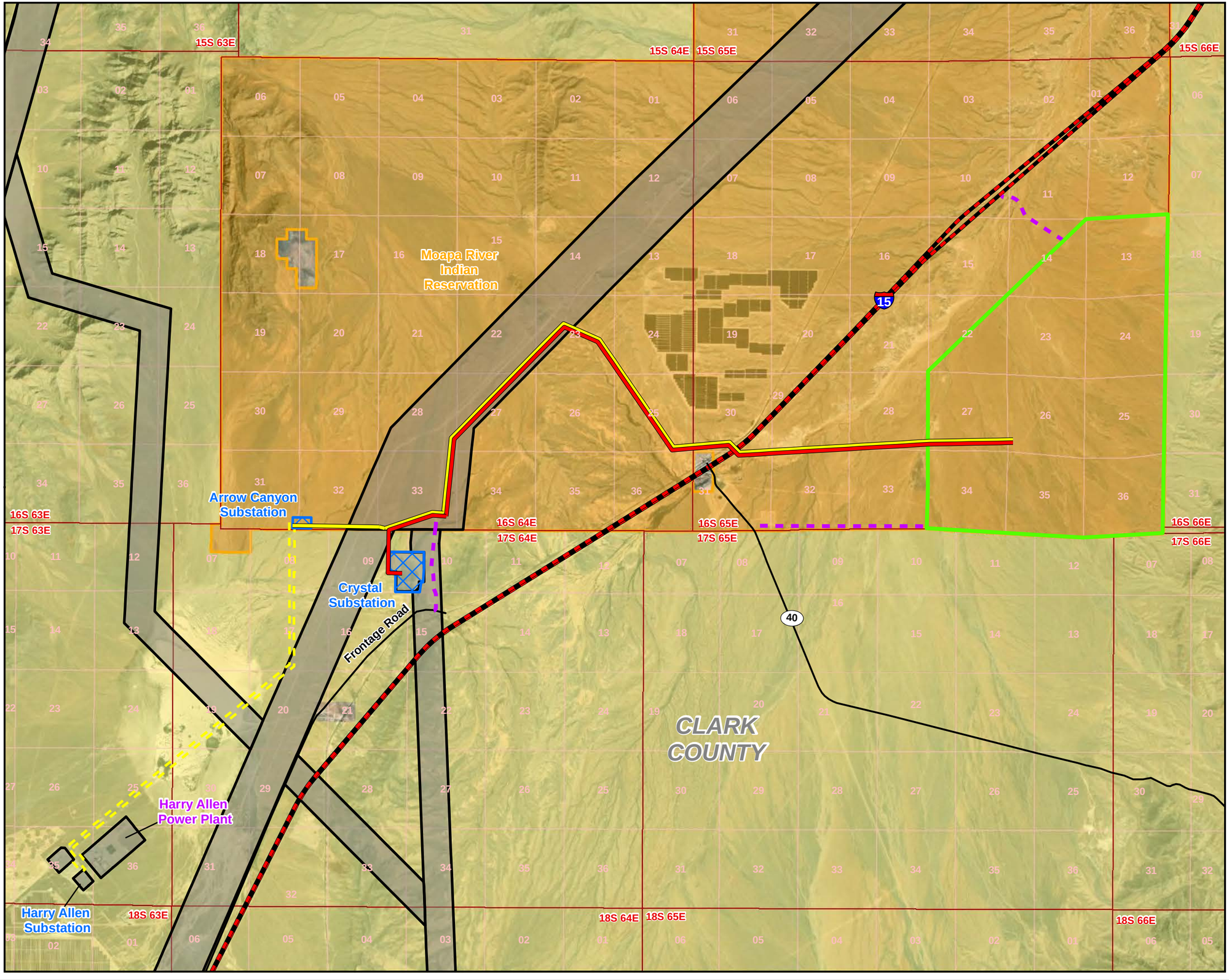
0 0.25 0.5
Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters



Legend

Project Components

- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Approved ROW Arrow Canyon - Harry Allen

General Features

- Interstate
- Major Highway
- Railroad
- Stream / River
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 0.5 1 1.5

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

Figure 3
Project Overview Map

Map Extent: Clark County, Nevada

Date: 07-26-21		Author: rnc

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3.2 Project Components

The Projects' SPGF would include the following main components. Only the components that pose potential risks to birds and bats are discussed further below. **Figure 3** shows the Chuckwalla Projects components.

3.2.1 Solar Field

The solar field would utilize crystalline silicon, bi-facial, or thin-film PV panels that would be mounted on single-axis trackers. Onsite facilities would impact only a portion of the 6,500-acre lease area on the Reservation. and would include:

- Solar Field with Single-axis Tracking Systems
- On-site Electrical Collection System and Substations
- Site Security and Fencing
- Communication Systems Infrastructure
- Operations and Maintenance Area
- Internal Project Roads
- Battery Energy Storage System (BESS)
- Lighting
- Water Supply
- Wastewater Treatment
- Drainage and Stormwater Controls
- Waste and Hazardous Materials Management
- Fire Protection

3.2.2 Substation

Two substations would be built on the solar site to facilitate interconnecting the Projects. One would accommodate the 230kV gen-tie connecting Chuckwalla 1a and 1b. The other would accommodate the 230kV or 500kV gen-tie connecting Chuckwalla 2 and 3. The two substations would be located adjacent to one another within the shared facilities area on the site.

The Chuckwalla 1a and 1b site substation would include medium voltage (34.5kV) to high voltage (230kV) step-up transformer(s) with mineral oil, breakers, buswork, protective relaying, supervisory control data acquisition (SCADA), and associated substation equipment. The site substation serving both Chuckwalla 2 and 3 would include the same equipment except that the step-up transformer could be 34.5/500kV if the gen-tie line were to be built at 500kV. If the Chuckwalla 2 and 3 gen-tie is built at 230kV,the site substation would include a medium voltage (34.5kV) to high voltage (230kV) step-up transformer and an additional 230/500kV step-up station would be built near the existing Crystal Substation from which a short 500kV line would provide the interconnection to Crystal at 500kV.

The relative location of the site substations is shown on the site layout plan for the Projects (**Figure 4**) and **Figure 5** shows a conceptual substation layout. Each substation would be fenced for safety

in accordance with applicable codes and one or more structures may be outside the fence for meters and control equipment. The communication system for the substation may include above-ground fiber optic cable and/or a microwave tower mounted on the control building or on a lattice tower up to 100 feet tall. If a fiber optic line is used, it would be mounted on the gen-tie line structures as one of the shield-wires.

- Met Tower
- Microwave Tower
- Water Well
- Tavaci Gentie
- Proposed Fence Line
- Railroads
- Collection Line Stream Crossings
- Project Roads
- Controlled-access Highway
- Solar Panel Area
- Inverters & Co-Located DIstributed BESS
- Drainage Ditch
- Battery Storage Yard
- Laydown Yards - Temporary
- O&M Large
- O&M Small
- Substation Main Site
- Substation Alternate Site
- Batch Plant Yard
- Construction Staging Area/Parking Lot
- HeliPad
- Dust Control Retention Pond - 180' x 300'
- Chuckwalla Phase 1A
- Chuckwalla Phase 1B
- Chuckwalla Phase 2
- Chuckwalla Phase 3
- Shared Use Area

Chuckwalla Phase 2
1573.6 acres
Tavaci

Chuckwalla Phase 1A
1976.1 acres
Chuckwalla

Shared Use
164.9 acres

Chuckwalla Phase 1B
478.7 acres
Tavaci

Old Corkscrew Road

Chuckwalla Phase 3
2224.6 acres
Tavaci

S R 40

Valley of Fire Hwy

0 0.17 0.35 0.7 1.05 1.4 Miles

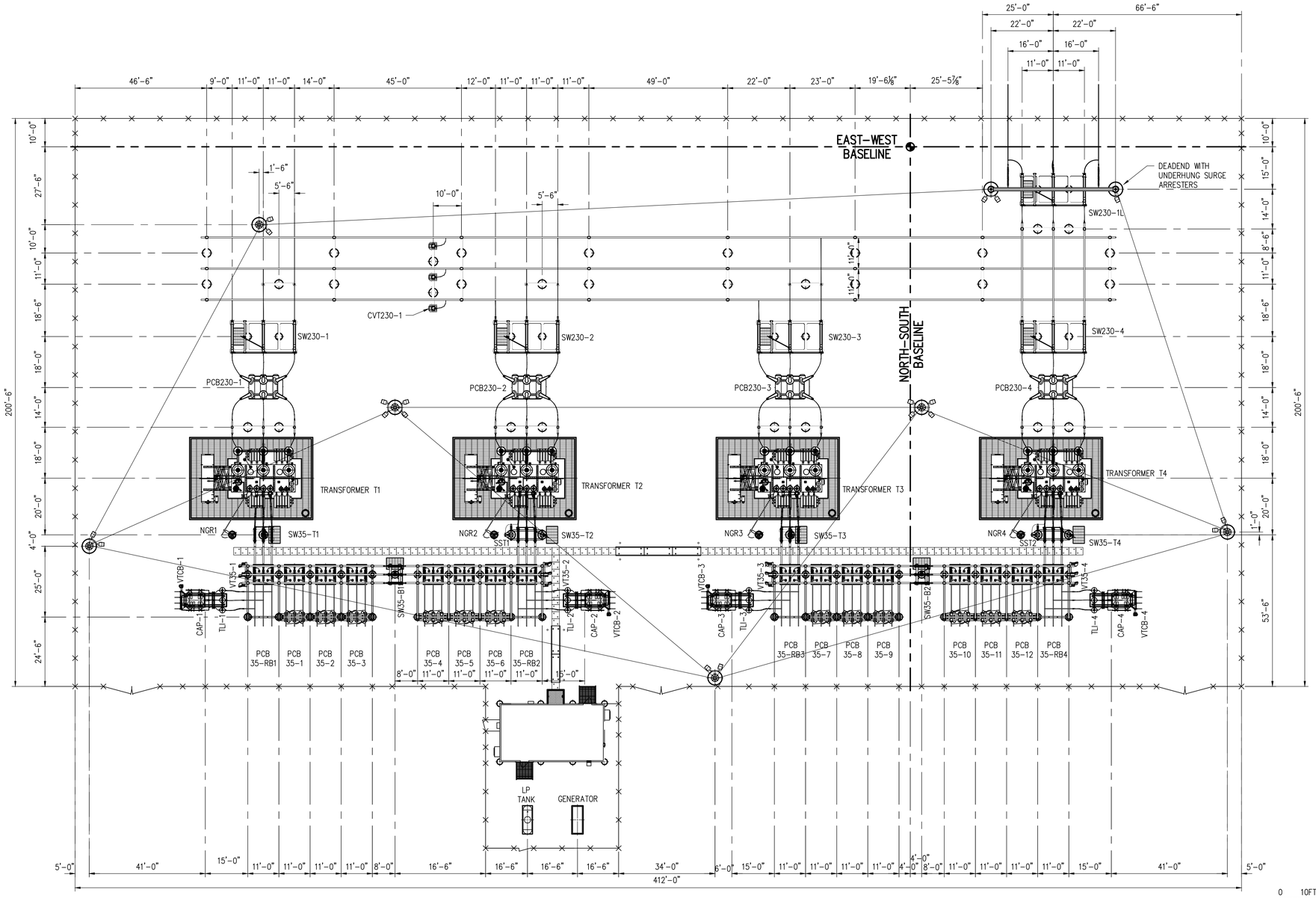
Source: Source | YYYY| G:\Projects\SA_West\Tavaci\05_GIS\Tavaci.aprx | Layout: Site_Plan_Chuckwalla_BIA_20210913 | Last Updated 10/7/2021 by peter.boxer

EDF renewables

Figure 4 Site Plan

Chuckwalla Solar Project | Clark County, Nevada

SP



STRUCTURE DESIGN CRITERIA

230 kV CLEARANCE: (900kV BIL)

LIVE PARTS: MIN ø–G=71"
MIN ø–ø=89"

TO GRADE: 15'–0" (BUS)
27'–0" (DRIVEWAY)

34.5 kV CLEARANCE: (200 kV BIL)

LIVE PARTS: MIN ø–G=13"
MIN ø–ø=18"

TO GRADE: 10'–0" (BUS)
22'–0" (DRIVEWAY)

NOTES

SCALE: 1"=20'–0"

PRELIMINARY
NOT FOR CONSTRUCTION

FILE LOCATION: L:\EDF RENEWABLE\EDF–XXX PALEN\SUBSTATION\100 CADD\110 WORKING\111 PHYSICAL\PALEN 460 MW\ALS–D–P003–1–OPTION 2.DWG LAST SAVED BY: jdpinnick 9/12/2018 3:36 PM PLOTTED BY: Jill D. Pinnick 9/12/2018 3:37 PM Tab: ALS–D–P003–1

"Engineering with Distinction"
ELECTRICAL CONSULTANTS, INC.
BILLINGS, MONTANA

NO	REVISION	DATE	BY	APR
A	PRELIMINARY	08/23/18	STD	JMT

edf renewables

ENGINEERING RECORD		DATE
DRAWN	DENNING	08/23/18
DESIGNED	DENNING	08/23/18
CHECKED		
APPROVED		
DWG SCALE: 1" = 20'	PLT SCALE: 1:1	

DWG. NAME: ALS–D–P003–1 – OPTION 2 | REVISION NO : A

3.2.3 Gen-tie Lines

The Project would use H-frame or single steel pole structures that would be made of self–weathering or galvanized steel. The steel monopole transmission structures would be used for the 230kV gen-tie lines and H-frame structures for the 500kV line. The structures would range in height from 120 feet to 170 feet. Illustrations of the typical steel pole and H-frame structures that could be used for this Project are provided in **Figures 6** and **7**.

The design, construction, operation, and maintenance of the transmission lines would meet requirements of the National Electrical Safety Code (NESC); U.S. Department of Labor, Occupational Safety and Health Standards; and the Resource Management Plan's requirements for safety and protection of landowners and their property. Transmission line design would also be consistent with recommendations for reducing negative impacts of power lines on birds found in Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 by Edison Electric Institute and the Avian Power Line Interaction Committee (APLIC 2006) and Reducing Avian Collisions with Power Lines by the U.S. Fish and Wildlife Service and the APLIC (APLIC 2012).

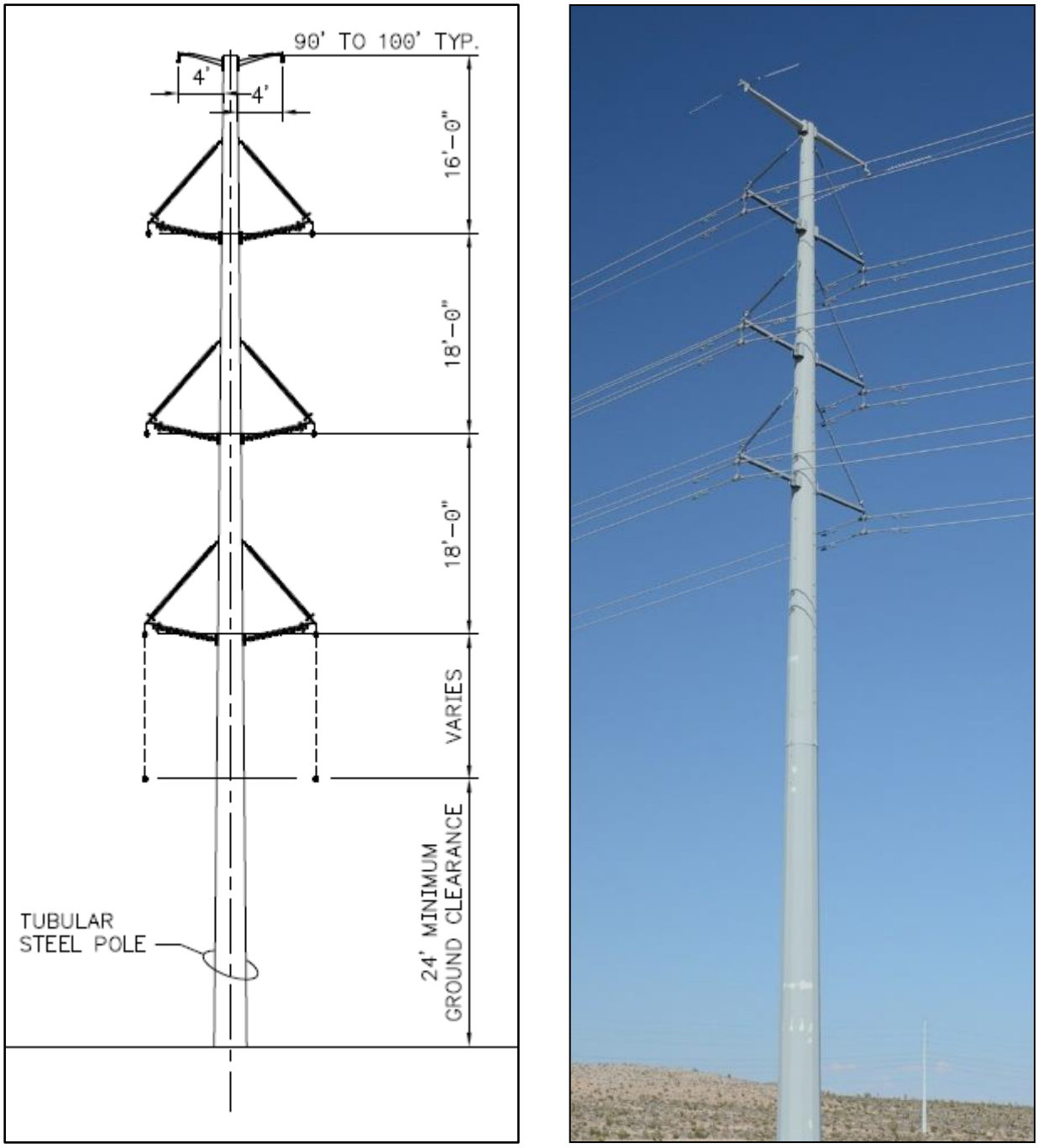


Figure 6
Typical Steel Pole Gen-Tie Transmission Structure

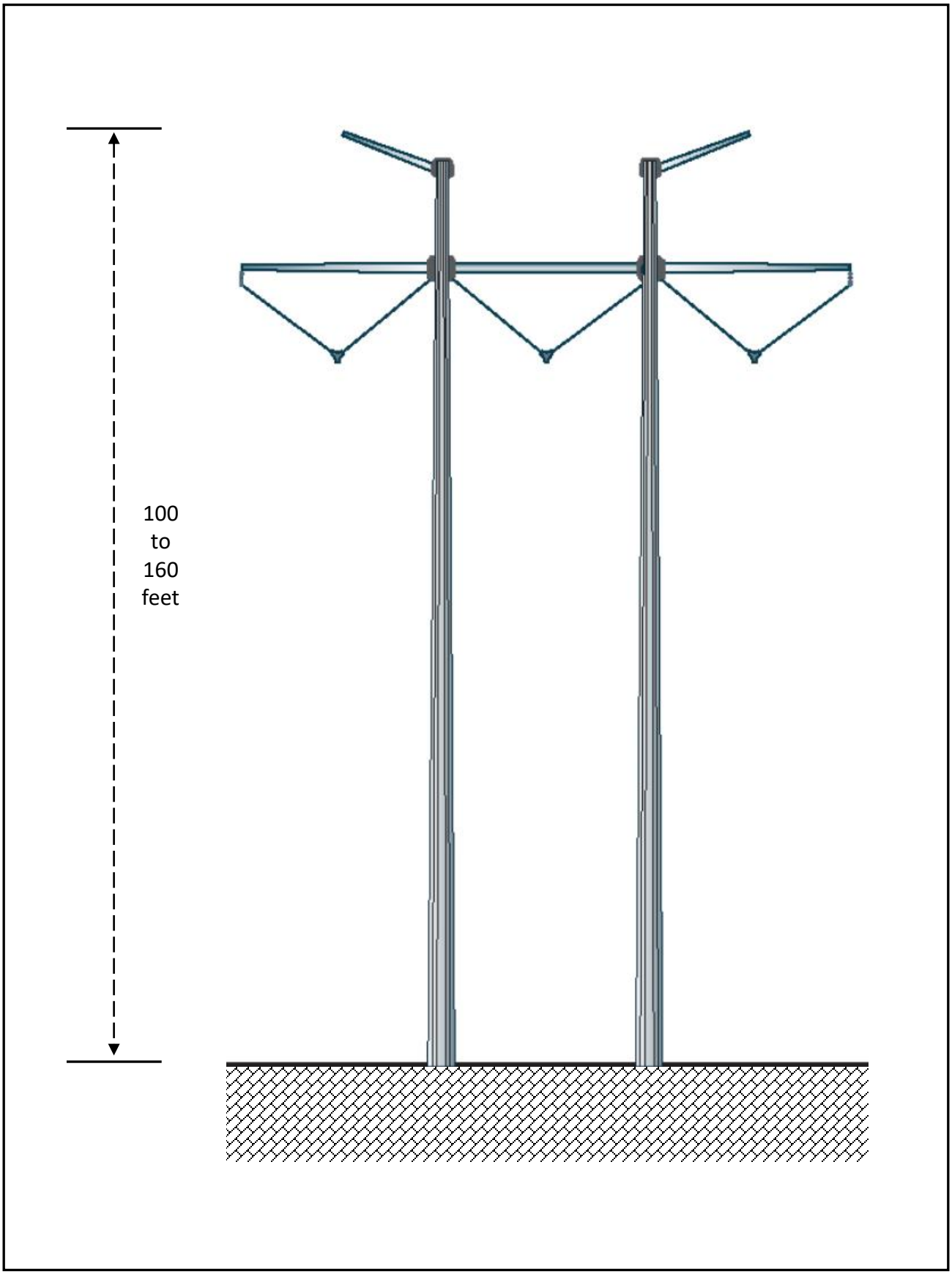


Figure 7
Typical 500kV H-Frame Structure

3.2.4 Artificial Lighting

The Projects' lighting system would provide operation and maintenance personnel with illumination for both normal and emergency conditions near each main entrance, the Project substations, and at the BESS facilities. Lighting would be designed to provide the minimum illumination needed to achieve safety and security objectives and would be downward facing and shielded to focus illumination on the desired areas only. There would be no lighting in the solar field except for emergency lighting at the BESS facilities. Therefore, light trespass on surrounding properties would be minimal. If lighting at individual solar panels or other equipment is needed for night maintenance, portable lighting would be used.

4 Species of Concern

The Proposed Project Area supports suitable nesting and/or foraging habitat for several avian species and potentially suitable foraging habitat for several species of bat. Species observed in or adjacent to the Project Area during Chuckwalla Projects biological surveys and site visits were typical of the Mojave desert and included several species of birds. Commonly observed avian species include: horned lark (*Erimophila alpestris*), black-throated sparrow (*Amphispiza bilineata*), ash-throated flycatcher (*Myiarchus cinerascens*), black-tailed gnatcatcher (*Polioptila melanura*), loggerhead shrike (*Lanius ludovicianus),* common raven (*Corvus corax*), burrowing owl (*Athene cuniclaria*) and red tailed-hawk (*Buteo jamaicensis*). The following section describes the known and predicted occurrences of sensitive avian and bat resources in and around the Proposed Project Area.

4.1 Bat Species

No bats are currently listed by the USFWS as threatened or endangered in Nevada or Clark County (USFWS 2021a and 2021b). One species of bat is listed as threatened by the Nevada Natural Heritage Program as threatened in Clark County, Nevada (NNHP 2021). Twelve species of bat could occur within the Proposed Project Area, and the Nevada Natural Heritage Program (NNHP) has designated nine as sensitive, protected, or threatened species. If present at all, these species are only expected to be present within the Proposed Project Area during nocturnal foraging events and are addressed in **Table 1.** Based on field surveys, there are no known or expected roosting locations or hibernacula within or in the immediate vicinity of the Proposed Project Area.

TABLE 1 – BAT SPECIES WITH THE POTENTIAL TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Status	Habitat	Potential to Occur
California leaf-nosed bat	*Macrotus californicus*	NS[1]	Caves, mines and rock shelters mostly in lower elevation creosote bush scrub habitat in proximity to riparian habitat. Forages in open areas over flats and washes near roosting sites.	Low potential to occur. Occurs at lower elevations and near riparian habitats, which are not present in the Project Area.
Townsend's big-eared bat	*Corynorhinus townsendii*	NS	Use a variety of habitats from arid desert scrub to pine forests, but always near roosting areas which are in caves/mines. Forages along riparian areas and generally prefers mesic habitats.	Low potential to occur. Mine and cave obligates and none are present in the Project Area. Foraging habitat not present within the Project Area.

Common Name	Scientific Name	Status	Habitat	Potential to Occur
Western red bat	*Lasiurus blossevillii*	NS	Found primarily in wooded habitats including mesquite bosque and cottonwood/willow riparian areas. Typically roosts in trees.	Low potential to occur. No suitable woodland or riparian habitat in the vicinity of the Project Area.
Fringed myotis	*Myotis thysanodes*	NP[2]	Roosts in caves, mines and is mainly found in woodlands/pine forests at higher elevations, but will sometimes occupy desert scrub.	Low potential to occur. No caves or mines are present in the Project Area.
Pallid bat	*Antrozous pallidus*	NP	Arid regions with rocky outcroppings, roosting in caves/mines, deep canyon crevices, under bridges and human structures. Forages over open areas near roosting locations.	Low potential to occur, no roosting habitat present in the Project area.
Spotted bat	*Euderma maculatum*	NT[3]	Occurs primarily in arid or ponderosa pine forests and marshlands. Sometimes in deserts and grasslands Prefers to roost in rock crevices on vertical cliffs and open canyons. Associated with rocky cliffs. Forages in canyons, in open areas, and over riparian vegetation.	Low potential to occur, no cliff or canyon roosting or foraging habitat present in the Project Area.
Allen's big-eared bat	*Idionycteris phyllotis*	NP	Inhabits mountainous areas and uses a variety of habitats, including desert scrub, coniferous forests, and riparian woodlands. Roosts in rocks, snags, and cliffs, but most roosts are found in mines.	Low potential to occur, no suitable roosting habitat is present in the vicinity of the Project area.

Common Name	Scientific Name	Status	Habitat	Potential to Occur
Mexican free-tailed bat	*Tadarida brasiliensis*	NP	Roosts in caves, trees and man-made structures, typically near water sources where foraging primarily occurs, but will also forage over open areas. Found from low desert to high mountains.	Low potential to occur, no water sources nearby and no roosting habitat.
Western mastiff bat	*Eumops perotis*	NS	Roosts in deep rock crevices or crevices in man-made structures high above the ground. Found in open areas in a variety of habitats with abundant roost locations.	Low potential to occur, reliance on significant rock features for roosting which are not present in the Project Area.

NNHP 2021, Bradley et al. 2006
[1] NS Nevada State Sensitive Species protected under NRS 501, NAC 503.
[2] NP Nevada State Protected Species protected under NRS 501, NAC 503.
[3] NT Nevada State Threatened Species protected under NRS 501, NAC 503.

4.2 Federally Protected Avian Species Likely to Occur in the Project Area

4.2.1 Golden Eagles

The golden eagle is protected under the BGEPA, which includes the September 11, 2009 Eagle Rule (Rule) (50 C.F.R. parts 13 and 22), as well as the MBTA. Periodic helicopter surveys by the Nevada Department of Wildlife (NDOW) indicate that suitable nesting and remnant nests occur approximately 10 to 12.2 miles north and west of the Proposed Projects.

The entire Proposed Project site is considered suitable foraging habitat for golden eagles and the species is likely to occasionally forage within the Proposed Project site. No suitable nesting habitat is present in the Proposed Project site and no known active nests occur closer than 10 miles from the Project Area. The construction, operation, and maintenance of the Projects is not expected to result in take of golden eagles. However, the potential for collision with project infrastructure would be increased by the construction of these Projects if proper precautions are not taken.

4.3 Special Status Avian Species

In addition to the BGEPA, ESA, and MBTA, the State of Nevada has additional protection for endemic avian species. **Table 2** addresses these special status species that could be found in the Proposed Project site, the protection afforded these species, the associated habitat, and the likelihood of occurrence.

TABLE 2 – SPECIAL STATUS AVIAN SPECIES WITH THE POTENTIAL TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name	Status	Habitat	Potential to Occur
Golden eagle	*Aquila chrysaetos*	BGEPA[9], BCC[8], NW[5]	Rolling foothills and mountain terrain as well as wide arid plateaus, open desert and scrubland. Uses cliffs, rock outcroppings and tall trees for nesting.	Low likelihood to occur. See in depth discussion in Section 4.2.1.
Yellow-billed cuckoo	*Coccyzus americanus occidentalis*	LT[7], NS[2]	Open woodland, parks, deciduous riparian woodland; nests in tall cottonwood and willow riparian woodland.	Low likelihood to occur. No suitable riparian woodland habitat present, but may occur flying over the Project area during migration periods.
Western burrowing owl	*Athene cunicularia hypugaea*	BCC, NW	Open grasslands, desert scrub, agricultural lands and open stages of pinyon-juniper habitat. Utilizes abandoned burrows for nesting purposes.	High likelihood to occur. May forage or nest in the Project Area. None detected during biological surveys, but sign was observed on four burrows .
Ferruginous hawk	*Buteo regalis*	NW	Breeds in open grasslands, sagebrush flats, low foothills, sparse riparian areas, canyons, and fingers of pinyon-juniper and other forest types. Winters in open terrain from grassland to desert, especially in areas where small mammals are abundant.	Moderate likelihood to occur during winter months for foraging. No likelihood to occur during breeding season. No suitable breeding habitat present.
Swainson's hawk	*Buteo swainsoni*	NW	Nests in agricultural valleys or open grasslands with scattered trees for nesting. Forages near nesting area in grasslands or agricultural fields. Migrates to S. America during winter.	Low likelihood to occur. No suitable habitats for foraging or nesting present, but may occur flying over the Project Area during migration.
Western snowy plover	*Charadrius nivosus nivosus*	NW	Beaches, dry mud or salt flats, sandy shores of rivers, lakes, and ponds are used for foraging and nesting purposes. Some populations migrate from inland regions to the	Low likelihood to occur. No suitable nesting or foraging habitat present, but may occur flying over the Project Area during migration.

Common Name	Scientific Name	Status	Habitat	Potential to Occur
			coast during winter.	
Southwestern willow flycatcher	*Empidonax traillii extimus*	LE[6], NE[4]	Thickets, scrubby and brushy areas, open second growth, swamps, and open woodland near running water.	Low likelihood to occur. No suitable riparian habitat present for breeding and foraging, but may occur flying over the Project Area between water sources or during migration.
Peregrine falcon	*Falco peregrinus*	NE	Utilizes various open environments including open water, desert shrub, and marshes usually in close association with suitable nesting cliffs; also, mountains, open forested regions, and human population centers.	Low likelihood to occur. No suitable cliff nesting habitat and little potentially suitable foraging habitat present.
Pinyon jay	*Gymnorhinus cyanocephalus*	NW	Pinyon-juniper woodland, less frequently pine, also occurs in scrub oak and sagebrush. Forages in woodlands and grasslands.	No likelihood to occur. No suitable habitat present.
Loggerhead shrike	*Lanius ludovicanus*	NS	Open country with scattered trees and shrubs, grassland or pastureland, savanna, and desert scrub.	High likelihood to occur. May forage within the Project Area. Individuals have been observed during biological surveys.
Yuma Ridgway's rail	*Rallus obsoletus yumanensis*	LE, NE	Freshwater marshes dominated by emergent plant species such as cattails and bulrushes.	Low likelihood to occur. No suitable freshwater marsh breeding or foraging habitat present, but may occur flying over the Project Area between water sources and/or during migration.
LeConte's thrasher	*Toxostoma lecontei*	NP[1]	Habitat consists of sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills. Typically nests in spiny shrubs and trees or cacti.	High likelihood to occur. Suitable habitat present.
Brewer's sparrow	*Spizella breweri*	NS	Strongly associated with big sagebrush in areas with scattered shrubs and short grass, especially	Low likelihood to occur. No suitable sagebrush habitat present for breeding, but may use the

Common Name	Scientific Name	Status	Habitat	Potential to Occur
			during breeding season. During the winter, open creosote bush scrub is used as well.	area during winter months.
Bald eagle	*Hailiaeetus leucocephalus*	BGEPA, NE	Large bodies of water for foraging. Mature trees along a habitat edge near a water source are preferred for roosting.	No likelihood to occur. No suitable nesting or foraging habitat present.
Bendire's thrasher	*Toxostoma bendirei*	BCC, NP	Variety of desert habitats with fairly large shrubs or cacti and open ground, or open woodland with scattered shrubs and trees. Very rare species.	Low likelihood to occur. Suitable desert habitat present, but species is very rare.
Green-tailed Towhee	*Piplio chlorurus*	BCC	Dense, shrubby habitat, sometimes with scattered trees or cacti. In winter they move to dry washes, arroyos, mesquite thickets, creosote bush, and desert grasslands	Moderate likelihood to occur during winter months. Suitable wintering habitat present.
Sagebrush Sparrow	*Artemisiospiza nevadensis*	BCC	Breeds in shrub-steppe habitats with tall shrubs such as sagebrush, saltbush and rabbitbrush. Winters in dry shrublands or grasslands, including creosote and saltbush-dominated desert scrub.	Moderate likelihood to occur during winter months. Suitable wintering habitat present.

NatureServe 2021, NNHP 2021, USFWS 2021b.
[1] NP Nevada State Protected Species protected under NRS 501.
[2] NS Nevada State Sensitive Species protected under NRS 501.
[3] NT Nevada State Threatened Species protected under NRS 501.
[4] NE Nevada State Endangered Species protected under NRS 501.
[5] NW Nevada NNHP Watch-List Species
[6] LE USFWS Listed Endangered
[7] LT USFWS Listed Threatened
[8] BCC USFWS Bird of Conservation Concern.
[9] BGEPA Bald and Golden Eagle Protection Act

5 Areas of Risk

This section outlines potential risks to birds and bats resulting from the Projects. Based on the Project locations and details and results of the wildlife surveys completed for the Projects, potential Project related risks associated with the construction and operation would include collision with overhead utility lines (including the substation), solar panels and other SPGF features, electrocution, territory abandonment and nest disturbance, loss of foraging habitat and habitat fragmentation, artificial lighting, and disturbance due to ongoing human presence at the facility.

5.1 Collision Risk

Vulnerability to collision depends on many factors including bird behavior and maneuverability, topography, weather, solar facility and collector line design, and placement of components on the landscape. Bird collision with power lines has been documented for decades, and risk of collision is considered highest in areas where birds congregate, such as power lines that bisect daily flight paths to meadows, wetlands, and river valleys (APLIC 2006). Bird collisions with PV panels has been documented and studied for a relatively short period of time, and there are a small number of peer-reviewed publications documenting fatality risks to birds associated with PV panels.

Birds may have significant "blind spots," increasing risk of collision even during daylight hours. Scanning below for prey or roost sites can render them blind to objects in the direction of travel (Martin and Shaw 2010). Structures associated with the SPGF, PV panels, overhead collector lines, or the onsite substation could present a collision risk. This risk should be minimal due to the relatively low height of these structures (up to 18 feet). Given that the Projects are located near an existing utility corridor that is currently occupied by seven electric transmission lines ranging in size from 230-kV to 500-kV, the addition of another gen-tie line in this existing utility corridor is unlikely to have an appreciable cumulative effect on in-air collisions. Transmission lines are the Project components that present the greatest risk of avian collision. The existing lines have been in place for many years and foraging flight patterns of resident birds have most likely modified their behavior due to the vast size and locations of the utility infrastructure.

5.2 Electrocution

Power lines are present in many wildlife habitats and may result in the electrocution of raptors and other bird species (APLIC 2006; Lehman et al., 2010 and references therein). The potential for electrocutions depends on the arrangement and spacing of energized and grounded components of poles and towers that are sometimes used for perching, nesting and other activities (APLIC 2006, 2012). However, nearly all electrocutions occur on smaller, more tightly spaced residential and commercial electrical distribution lines that are less than 69-kV (APLIC 2006, 2012).

To protect avian species from electrocution, APLIC has established guidelines for electric line design. Incorporating appropriate design standards into any collector or other electric lines on the SPGF will minimize electrocution risk. The overhead collector lines will have clearances between

electrical components as recommended by APLIC (2006, 2012), e.g., at least 60 inches of horizontal separation and a vertical separation of 40 inches between phase conductors, which is greater than the physical dimensions of all large birds, including eagles, that could potentially use the structures for perching. In situations where particular hardware would present an electrocution risk (e.g., jumpers, cutouts, arrestors, transformers, etc.), perch guards and/or insulators will be installed, per APLIC guidelines, to minimize electrocution risk. Therefore, electrocution of all birds including raptors would be unlikely.

5.3 Territory Abandonment and Nest Disturbance

The Tribe and Bureau of Indian Affairs (BIA) do not have regulations quantitatively limiting noise generation or effects from the Projects during the temporary construction phases or operational phase. The EPA has developed and published a criterion to be used as an acceptable guideline when no other local, tribal, county, or state standard has been established (EPA 1974). The Projects would affect ambient noise and vibration levels if they would result in the generation of noise levels or exposure of sensitive species to noise levels or ground-borne vibration in excess of standards established in applicable federal, state, and local general plans or noise ordinances (in this case, EPA standards).

There is the potential for golden eagles, as well as other bird species, to use the Project Area for foraging and other birds for nesting. Birds would be susceptible to noise disturbance as described in Section 3.7 of the DSEIS, potentially resulting in alteration of foraging and/or nesting behaviors. There is potential for nest disturbance of migratory birds including burrowing owl burrows during the construction phase of the Project from noise, removal of vegetation, and leveling the ground. Known golden eagle nesting areas are located 10 to 12.2 miles from the Projects. Noise and other construction activity would affect nesting behavior of these known nests at this distance.

Short term impacts could result to birds. Vegetation within the solar arrays will be crushed and rolled and is expected to grow back quickly after construction; this vegetation will likely provide suitable nesting habitat for birds. The presence of humans and machinery may deter some, but not all birds from nesting within the solar facility during operations. Noise from inverters and tracking panels may impact wildlife species within and immediately adjacent to the facility. Only short-term impacts would occur from noise and vibration during the construction phase. Most non-listed bird species would return to the area after construction if significant habitat and foraging opportunity exists.

5.4 Habitat Loss and Fragmentation

An estimated 379 acres is considered suitable foraging habitat for Golden Eagles and other avian/bat species discussed in this BBCS would be permanently affected by the Projects, with additional temporary losses of an estimated 4,835 acres of foraging habitat during construction activities. Loss of foraging habitat could impact foraging behaviors of these avian and bat species. The Proposed Projects permanent impact of 379 acres of this habitat is very small (<0.01% assuming 10-mile foraging area) in comparison to available habitat within the area.

The Project Area currently supports suitable nesting and foraging habitat for some avian species, and foraging habitat for some bats. These species could potentially be adversely affected during construction and operation activities. Bird nesting could also occur in the limited vegetation in the Project Area and in ground burrows in or near the Project Area. In the vicinity of the Projects, the avian nesting season for most bird species is from late February to early July. The human activity at the Chuckwalla Projects could attract undesired species, such as ravens, that could affect the ability of other species to nest in the area. Workers will be trained to avoid activities that attract ravens and other scavengers/predators such as coyotes (*Canis latrans)* to the Project Area, per the Projects' Raven Control Plan.

Bat roosts or nursery colonies can occur in a variety of natural substrates or manmade structures that provide specific thermal properties and protection from predators. Typically, these are large, stable structures, uninhabited or with minimal use by humans, such as buildings, barns, bridges, or caves, mines, and trees. Likewise, aquatic features that produce insects can be an important resource for foraging bats. No bat roosting habitat currently exists for sensitive bat species within or near the Project site, but the site potentially provides bat foraging habitat. Because bats do not forage during daylight hours and the majority of the construction would take place during the daytime, with the potential for limited night work, the potential for Project-related construction or operations impacts on bats is limited.

Direct habitat loss will occur from the Projects, and habitat fragmentation may reduce the functionality of this area for birds and bats; however, because an abundance of similar lands are available in the vicinity to provide habitat for any avian individuals displaced from the Project site, and since this Project site is not located in a sensitive, unique, or significant area of ecological importance to bird or bat species, the impacts are likely to be small and have no significant population level effects on any bird or bat species in the area.

5.5 Artificial Lighting

Additional light sources during the operation of the Chuckwalla Projects could result in concentrated foraging locations of avian and bat species that feed on insects nocturnally since the artificial lighting could attract insects. Artificial lighting also has the potential to negatively affect migration patterns of migratory birds and bats that move through the area. Lighting impacts would be reduced by designing all lights to provide the minimum illumination needed to achieve safety and security objectives and by facing all lights downward and shielding them to focus illumination on the desired areas only. If lighting at individual solar panels or other equipment is needed for night maintenance, portable lighting will be used.

5.6 Ongoing Human Disturbance

Maintenance would consist of dust control and grounds upkeep, cleaning and repair of modules, repair and upkeep of all transformers, inverters and wiring collection systems, control systems upkeep, building maintenance and water treatment, and permanent storm water controls and

maintenance.

Routine Preventative Maintenance (PM) activities would be scheduled in accordance with the frequencies outlined in the Original Equipment Manufacturer (OEM) specifications. O&M would require the use of vehicles and equipment including but not limited to welding, re-fueling, lubricating, panel washing equipment, forklifts, manlifts, and chemical sprayers for weed abatement. Flatbed trucks and pick-up trucks as well as utility vehicles would be used on a daily basis during construction at the facility and on-site.

Major equipment maintenance and overhauls would be completed at intervals of approximately 5-10 years. Replacement of non-functioning equipment may require the use of heavy haul transport equipment and large overhead cranes. Noise and activity disturbance would occur as a result of the O&M activities, but the impacts would be minor and intermittent in nature and are expected to have little or no added impacts to birds or bats in the area.

6 Mitigation Measures

As discussed in **Section 4**, the Proposed Project Area supports suitable habitat for avian species, thereby creating a potential for impacts on these species from construction and O&M activities. The potential for impacts to bats is low because they are not known to breed in the Proposed Project Area.

The following construction and operation measures will be implemented to minimize potential impacts on avian and bat species.

6.1 Electrocution

All utility poles would be designed to be avian-safe in accordance with the *Suggested Practices for Avian Protection on Power Lines: the State of the Art in 2006* (APLIC 2006) and *Reducing Avian Collisions with Power Lines* by the U.S. Fish and Wildlife Service and the APLIC (APLIC, 2012). All aspects of the substations, switching stations, and transformers would be constructed utilizing avian-safe practices as suggested by APLIC using industry standards (APLIC 2006). Any potential electrocution caused mortality to a bird or bat would be reported to the USFWS (**Appendix A**).

6.2 Anti-Perching and Nesting

To reduce perching along segments of the overhead collector lines or substation, perch deterrents would be installed during construction. Anti-perching and nesting devices are important tools for reducing the risk of avian electrocution, protecting desert tortoise from increased predation, and keeping the entire electrical system running smoothly. Perch deterrents are expected to be used primarily to eliminate hunting perches for raptor species. Deterring this kind of perching would limit the predation of other avian species or animals which use surrounding vegetation for foraging and nesting.

Inspections of lines and other areas where raptor or corvids (crows and ravens) might nest along the overhead collector lines or on the substation towers would be conducted monthly during the breeding season (February 15 to August 31st) for the first 3 years of operation. Unoccupied nests with no eggs or chicks are not protected by MBTA and removal would be conducted prior to the next breeding season. Should nesting activity become a long-term issue, alternate measures to discourage nesting activities should be implemented. Prior to removing or relocating any nests, facility personnel would consult with USFWS and when necessary, proper USFWS permits would be obtained. Reporting of nests and nest relocation would be completed using forms found in **Appendix B**. Removal of unoccupied nests with no eggs or chicks discovered by O&M staff would occur for the life of the project.

Any hollow mine claim markers discovered on site would also be removed to prevent birds from becoming entrapped.

6.3 Habitat Loss and Fragmentation

Construction of the Projects would have temporary and permanent impacts on vegetation, but the temporary impact areas would be allowed to re-vegetate, and wildlife species would be able to utilize them for habitat and foraging during O&M. Grading and vegetation removal would be minimized to the extent practicable for the Projects. Where feasible, site preparation activities would first implement mowing existing vegetation to a height of approximately 18 inches with the remaining standing vegetation flattened by the construction equipment using drive and crush techniques to minimize impacts to the roots of plants. Grading would be implemented for internal access roads, the substation, the O&M area, BESS locations, etc. and in areas within the solar arrays only where necessary. Where grading is not necessary, panels will be mounted at a height sufficient to avoid contact with vegetation and vegetation will only be trimmed as needed to allow for safe installation and maintenance of the PV tracking system. Since much of the vegetation within the Projects will be allowed to re-colonize after construction is complete, it is anticipated that certain bat and bird species would use the site to some extent during operations.

A Integrated Weed Management Plan (IWMP) will be prepared and submitted to the BLM, BIA and the Tribe for review and approval before construction begins. Methods of noxious weed and invasive species identification, prevention and treatment for the Projects are outlined in the IWMP. The IWMP recognizes the Projects' impact on vegetation and defines the expected treatments and activities necessary to both maintain the determined desired conditions for the vegetation community within the Reservation, and control the weeds that may arise within the up to 6,500-acre Chuckwalla Projects footprint.

6.4 Lighting

Lighting would be designed to provide minimum illumination needed to achieve O&M objectives and not emit excessive light to the night sky by installing light absorbing shields on top of all light fixtures and focusing desired light in a downward direction (Reed et al. 1985). This would reduce the visibility of the lights to migratory birds traveling through the area. Downward facing lights would also reduce the number of insects attracted to lights resulting in a decrease of potential concentrated feeding areas for bats. Any additional lighting needed to perform activities such as repairs would be kept to a minimum and only used when these actions are in progress.

6.5 Nest Disturbance and Territory Abandonment

Vegetation clearing and ground disturbing activities would be conducted outside the migratory bird nesting season when practical. If ground-disturbing activities cannot be avoided during this time period, pre-construction nest surveys shall be conducted by a qualified biological monitor within 3 days prior to the initiation of ground disturbing activities. For all non-raptor bird species, surveys would cover all potential nesting habitat in and within 300 feet of the area to be disturbed. Any disturbance or harm to active nests would be reported within 24 hours to the USFWS and the BLM, if on BLM lands. The biological monitor would halt work in the immediate vicinity if it is determined

that active nests are being disturbed by construction activities and the appropriate agencies would be consulted.

If vegetation clearing is proposed to begin during the breeding season, a qualified biologist would conduct pre-construction nest surveys within 3 days prior to any vegetation clearing activities to identify all active nests within the construction area, and the vegetation and habitat type in which each nest is found will be recorded. Nest locations would be marked using handheld GPS (but not marked in the field in order to avoid attracting potential nest predators); an avoidance area would be clearly marked on the ground in order to prevent equipment from impacting the nest. Environmental monitors would be in place during initial ground-disturbing activities during the construction period to minimize impacts to natural resources. During clearing activities associated with construction, qualified biologists would destroy bird nests only after young have fledged and perform any mitigation measures necessary to reduce or eliminate negative effects on avian species inhabiting the construction area. Activities associated with the removal of nests or relocation of Burrowing Owls are regulated by the USFWS under the MBTA.

If construction is scheduled to commence during the breeding season, a qualified biologist would conduct pre-construction surveys within 14 days prior to construction for western burrowing owl within suitable habitat prior to breeding season. All areas within 250 feet of the Projects would be surveyed, per USFWS 2007 Burrowing Owl guidance. If an active nest is identified, there would be no construction activities within 250 feet of the nest location to prevent disturbance until the chicks have fledged or the nest has been abandoned, as determined by a qualified biologist. The occurrence and location of any Western Burrowing Owl would be documented by biological monitors in daily reports and submitted to the lead biologist on a daily basis. The authorized biologist would report all incidents of disturbance or harm to Western Burrowing Owls within 24 hours to the USFWS and report any incidence of mortality on the proper form (**Appendix A**).

When removal of occupied burrows is unavoidable, the following mitigation measures shall be implemented outside of the breeding season:

- Passive relocation methods are to be used by the biological monitors to move the owls out of the impact zone. This includes covering or excavating all unoccupied burrows and installing one-way doors into occupied burrows. This will allow any animals inside to leave the burrow, but will exclude any animals from re-entering the burrow. A period of at least 48 hours is required after the relocation effort to allow the birds to leave the impacted area before excavation of the burrow can begin. The burrows should then be excavated and filled in to prevent their reuse.

6.6 Trash Disposal and Removal

To minimize activities that attract prey and predators during construction and operations, garbage will be placed in approved containers with lids and removed promptly when full to avoid creating

attractive nuisances for birds and bats, in compliance with the Raven Control Plan. Open containers that may collect rainwater will also be removed or stored in a secure or covered location to not attract birds. Litter from the Proposed Projects may also attract opportunistic scavengers such as common ravens, which have been known to predate juvenile desert tortoises. The above measures would help minimize common raven attraction to the Project site. For additional information on reducing the impacts of common raven predation see the Raven Control Plan for the Projects.

7 Monitoring

Bird mortalities observed during construction of the Projects would be documented and reported to the USFWS within 48 hours.

7.1 Pre-construction Avian Monitoring

Biological monitors would be assigned to the Projects in areas of sensitive biological resources. The monitors would be responsible for ensuring that impacts to special status species, native vegetation, wildlife habitat, or unique resources would be avoided to the fullest extent possible. Where appropriate, monitors would flag the boundaries of areas where activities would need to be restricted to protect the species of concern discussed in this BBCS as well as other plant and animal species not listed. Those restricted areas would be monitored to ensure their protection during construction.

7.2 Post-construction Mortality Monitoring

Post-construction monitoring is not proposed for these Projects. The Moapa Solar Project (formerly the K-Road Solar Project) is located on the reservation very close to and within the same habitat types as the Chuckwalla Projects (1.8 miles to the west). Moapa Solar (K-Road) has been conducting avian mortality surveys since January 2017. Surveys from January 2017 – July 2019 (29 months) have found only 9 total avian mortalities at the solar site, four of which were determined to be caused by collision and all are common species. No post-construction mortality monitoring would be necessary at the Chuckwalla Projects because the current data from the nearby existing project suggests limited avian mortalities at this location and within these habitat types. Following construction, O&M staff would be required to take the Worker Environmental Awareness Program (WEAP) training described below which would include a reporting protocol if avian mortalities were incidentally found during regular O&M activities. A Special Purpose Utility Permit (SPUT Permit) would be obtained by the owner to allow for handling, collection, and transport of dead or injured birds.

7.3 Permit Compliance

The Proponents may find it necessary in some situations to obtain federal and state permits regarding avian and bat species, including nest removal or relocation permits (depredation permit). In such situations, the Proponent may seek to obtain them by working with the federal and state resource agencies to determine which permits are necessary. Under no circumstances would the Proponent perform any activity requiring a permit without first obtaining the proper permit or authorization to do so.

7.4 Worker Environmental Awareness Program

A WEAP would be prepared and implemented. All construction crews and contractors would be required to participate in WEAP training prior to starting work on the Projects. The WEAP training would include a review of the special status species and other sensitive resources that could exist in the Project Area, the locations of sensitive biological resources and their legal status and protections,

and measures to be implemented for avoidance of these sensitive resources. A record of all trained personnel would be maintained.

7.5 Injured Birds and Rehabilitation Centers

If any injured birds or bats are discovered during the course of construction activities, biological monitoring, or operations, they would be safely captured and transported to a NDOW licensed wildlife rehabilitator. A mortality reporting data form will be completed for the injured individual for reporting purposes. Rehabilitators would provide guidance on transportation of the injured animal to their locations.

- Wild Wing Project
  4232 Tuffer Lane
  Las Vegas, NV 89130
  Primary Contact: Lisa Ross
  (702) 338-4382

- Animal Kingdom Veterinary Hospital
  1325 Vegas Valley Drive
  Las Vegas, NV 89109
  Primary Contact: Joanne Stefanatos
  (702) 735-7184

8 Adaptive Management

8.1 Agency Collaboration

This BBCS is a "living" document. Adaptive management will ensure an ongoing open communication between the Proponent and the agencies. The parties will cooperatively evaluate issues if they arise. The Applicant will work collaboratively with the BLM, BIA, Tribe and USFWS to comply with legal requirements as well as the requirements contained within this BBCS.

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CHUCKWALLA SOLAR PROJECTS

MORTALITY REPORTING FORM

DATE: _____ TIME: _____ OBSERVER: _____

PROXIMAL TO PROJECT COMPONENT: _____

CARCASS POSITION

GPS COORDINATES East: _____ North: _____

BEARING (degrees) to PROJECT COMPONENT: _____

DISTANCE (meters) to PROJECT COMPONENT: _____

CARCASS DESCRIPTION

SPECIES: _____

SEX (*circle*): M F U AGE (*circle*): A J U Tag/Band Number: _____

CONDITION (*circle*): intact scavenged dismembered feather spot injured

ESTIMATED TIME SINCE DEATH/INJURY (no. of days): <1 1 2 3 4 5 6 7 7+

CAUSE OF DEATH: _____

_____

OBSERVABLE INJURIES: _____

_____

SUBSTRATE/GROUND COVER (*at carcass location)*:_____

DISPOSITION OF CARCASS[1] (*circle*): left in place removed collected for trials collected for other:

_____

SHIPPED TO:

[name of institution] _____

[physical address] _____

[phone/email] _____

WEATHER CONDITIONS

AIR TEMPERATURE (degrees Fahrenheit): _____

PRECIPITATON (last 24 hours, *circle*): none light rain rain heavy rain hail snow

CLOUD COVER (*circle*): clear mostly clear partly cloudy mostly cloudy cloudy

WIND DIRECTION: _____ SPEED (mph, *circle*): 0-10 10-20 20-30 30+ gusty

NOTES (describe noteworthy weather conditions since last search, including high wind, fog, precipitation, and storm events):

_____

_____

_____

_____

PHOTOGRAPHS[2]:

Close Up: Photo 1 _____ Photo 2 _____

Landscape: Photo 3 _____ Photo 4 _____

PHOTO NOTES:_____

_____

NOTIFICATION[3]:

DATE: _____ TIME: _____

NAME: _____ AGENCY/ASSOCIATION: _____

NOTES:

_____

_____

_____

_____

[1] Permit required to handle bird carcasses.

[2] At least four photographs should be taken. Two should be close-in shots of the carcass and should be taken from at least two different angles. Two should be shots taken farther away showing the landscape (project components, surrounding habitat, etc.) and should be taken from at least two different angles).

[3] Indicate who was notified of the event, date, time, etc.

CHUCKWALLA SOLAR PROJECTS

NEST REPORTING FORM

DATE: _____ TIME: _____ OBSERVER: _____

PROXIMAL TO PROJECT COMPONENT: _____

NEST POSITION

GPS COORDINATES East: _____ North:_____

BEARING (degrees) to PROJECT COMPONENT: _____

DISTANCE (meters) to PROJECT COMPONENT: _____

NEST DESCRIPTION

SPECIES: _____

SEX OF INDIVIDUALS AT NEST (*circle all that apply*): M F U

AGE (*circle all that apply*): A J U

ESTIMATED NUMBER OF EGGS/CHICKS (IF APPLICABLE) _____

GENERAL DESCRIPTION OF NEST SITE

Substrate (e.g., cliff or outcrop [rock type], tree/shrub [species, live/dead], ground, artificial structure [type]):

_____

Estimated height of substrate: _____(m) Estimated height of nest above ground: _____(m)

Nest type and location on substrate (e.g., stick nest in upper/lower canopy stick nest on/in ledge, pothole, or crevice; scrape on/in ledge, pothole, or crevice; stick nest on artificial platform mounted in tree; tree cavity; burrow; etc.):

_____

Protection from weather (YES/NO; describe nature of protection, e.g., tree canopy, cliff backdrop, pothole/crevice, burrow, etc.):

_____

Approximate compass direction of exposure to elements (wind, sun, etc.): _____

Nest size—indicate whether estimated or measured: _____

Height (top to bottom)_____ Width (left to right)_____ Depth (back to front)_____ (meters)

Known or probable alternative nests within territory and associated nest #'s:

_____

_____

PHOTOGRAPHS[1]:

Close Up: Photo 1 _____ Photo 2_____

Landscape: Photo 3 _____ Photo 4_____

PHOTO NOTES:_____

_____

NOTIFICATION[2]:

DATE: _____ TIME: _____

NAME: _____ AGENCY/ASSOCIATION: _____

NOTES:

_____

_____

_____

[1] At least four photographs should be taken. Two should be close-in shots of the nest and should be taken from at least two different angles. Two should be shots taken farther away showing the landscape (project components, surrounding habitat, etc.) and should be taken from at least two different angles).

[2] Indicate who was notified of the event, date, time, etc.

Appendix I

Raven Control Plan

Raven Control Plan

Chuckwalla Solar Projects

December 2021

Table of Contents

List of Acronyms and Abbreviations

APLIC	Avian Power Line Interaction Committee
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CORA	Common Raven
EDFR	EDF Renewables Development, Inc.
EIS	Environmental Impact Statement
MBTA	Migratory Bird Treaty Act
Mph	Miles per Hour
PV	Photovoltaic
RCP	Raven Control Plan
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

1.1 Background

EDF Renewables Development, Inc. (EDFR, Applicant) has entered into an option agreement with the Moapa Band of Paiute Indians (Moapa Band or Band) to lease up to 6,500 acres for the development of up to four solar projects collectively referred to as the Chuckwalla Solar Projects (Chuckwalla Projects or Projects) to be located on the Moapa River Indian Reservation (Reservation) in Clark County, Nevada. The Chuckwalla Projects would include the four solar projects and all associated facilities. The Bureau of Indian Affairs (BIA), as lead agency in cooperation with the Moapa Band of Paiute Indians (Moapa Band), and other agencies, intends to prepare an Environmental Impact Statement (EIS) that will evaluate the Projects.

This Raven Control Plan (RCP) lists procedures the Projects will follow for the protection of wildlife species, such as the desert tortoise (*Gopherus agassizii*), from predation by other species that may be attracted to the Projects as a result of construction or operation activities. The RCP is being submitted to the United States Fish and Wildlife Service (USFWS) and Bureau of Indian Affairs (BIA) for approval prior to implementation. Once approved, the Applicant will be responsible for implementing the plan during the construction and operational phases of the Projects. This RCP addresses activities that will occur during construction and operation of the Projects regarding control of ravens as a nuisance species.

The desert tortoise is a federally-listed threatened species known to occur in and around the Project areas. The proposed Project areas are not located in designated Critical Habitat for the desert tortoise. This RCP has been developed as a mitigation measure to reduce the effects of the common raven (*Corvus corax*; CORA) and other avian predation on the desert tortoise and other native wildlife species as a result of increased human presence, the addition of potential roost and nest site structures, increased availability of water sources and facility operation.

Avian predators such as CORA, loggerhead shrikes (*Lanius ludovicianus*), and American kestrels (*Falco sparverius*) may be drawn to the Project areas based on an increase in refuse (e.g. food sources) such as garbage cans and an increase in nesting/perching areas such as the site perimeter fence. The solar generating facility sites provide suitable habitat for the desert tortoise. Avian predators drawn to the Project sites may forage nearby. An increase in avian predators within a project area is a known secondary negative project effect on the desert tortoise. Implementing this RCP is intended to reduce this potential impact.

1.2 Purpose of this Plan

The purpose of this RCP is to offset direct and indirect environmental impacts to the desert tortoise and other species of wildlife from Project development by implementing specific measures designed to limit wildlife attractions and discourage avian and other scavengers that may prey on wildlife (including sensitive species) in and around the Project areas. This includes, but is not limited to, collecting and disposing of all litter and trash found or produced at the site, as well as limiting the availability of water. All employees will be familiar with the RCP, and littering will not be permitted. The project proponent and its approved contractors would be responsible for implementing aspects of this RCP. This RCP is applicable to the construction and operation of the proposed Project.

1.3 Project Description

1.3.1 Project Area

The proposed Chuckwalla solar generating facilities would be constructed entirely within the Reservation within a lease study area of approximately 6,500 acres of tribal trust land. These lands are all located in the southeast corner of the Reservation in an area set aside by the Band exclusively for the Chuckwalla Projects. The solar fields and associated facilities would be in Sections 13, 14, 22, 23, 24, 25, 26, 27, 34, 35, and 36; Township 16 South, Range 65 East; Mount Diablo Base Meridian. **Figure 1** shows the proposed general location for the Projects.

The proposed Projects would occur in the Basin and Range physiographic province in a part of the Mojave Desert. This physiographic province is characterized by the hundreds of long, narrow, and nearly parallel mountain ranges that are separated by deep valleys. These features are visible at the proposed Project sites, with nearly parallel mountain ranges situated generally in a north-south direction that are located near the proposed Project sites. The majority of the Project sites occur in a sloping valley. The proposed Project sites occur in the Mojave Desert Scrub biome and are dominated by plants common to this biome including creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*).

1.3.2 Proposed Project

The following describes the major features of the proposed Projects. For a comprehensive description of the proposed Projects, refer to the associated Chuckwalla Solar Projects Draft Environmental Impact Statement (EIS) for the Project design details (subject to minor design changes).

The four solar projects would total up to 700 megawatts (MWs) of solar energy generation each using photovoltaic (PV) technology and incorporating battery energy storage systems (BESS). Primary access to the Chuckwalla sites would be provided from the Valley of Fire Highway via an existing 2.5-mile road on the Reservation that parallels its southern border and would be upgraded, as needed. Additional access to the northern portion of the lease area would be provided via another existing road on the Reservation. **Figure 2** shows the locations of the proposed gen-tie lines and access roads.

The water supply required for the Projects would be provided by the Moapa Band and drawn from the Moapa Band's existing water rights. The water would be provided from either existing tribal wells or a new well on the Reservation within the lease area. If the water is sourced from off-site wells, it could be delivered to the sites via pipeline or truck.

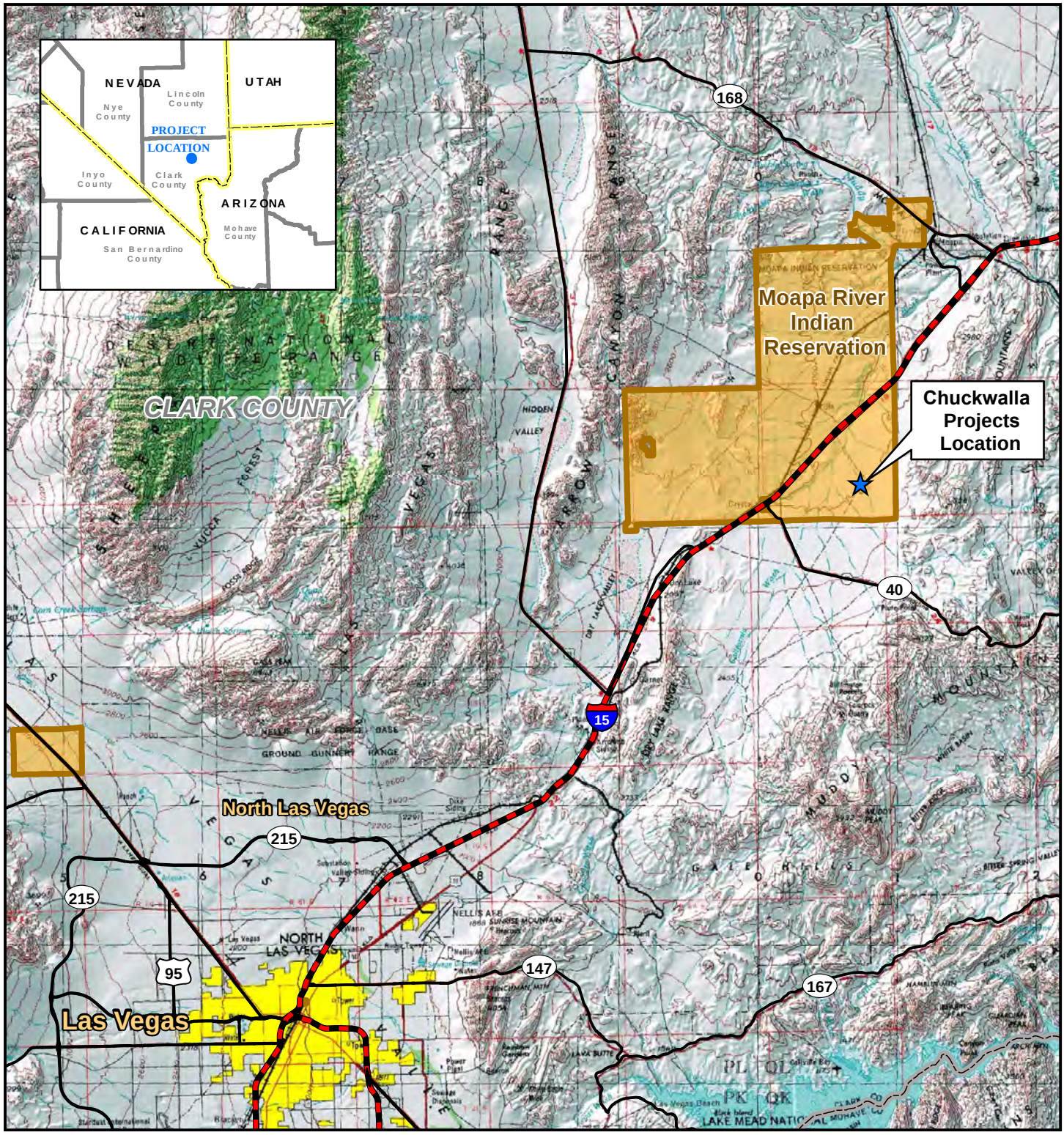
The Projects would include the following onsite key elements located within the up to 6,500-acre solar lease boundary. Onsite facilities would impact only a portion of the 6,500-acre lease area and would include:

- Solar Fields
- Battery Energy Storage System (BESS)
- Onsite Electrical Collection System and Site Substations
- Site Security and Fencing
- Communication Systems Infrastructure
- Operations and Maintenance Area
- Internal Site Roads
- Lighting
- Water Supply
- Wastewater Treatment
- Waste and Hazardous Materials Management
- Fire Protection Systems

Permanent disturbance areas would include piles, inverters/transformers, O&M area, substation, BESS, solar site roads within and between solar arrays, and drainage features. Temporary disturbance areas would include those portions of the solar field that are not graded, mowed to 18 inches and crushed, graded but not permanently occupied, and laydown areas.

Fire Prevention

The Project's fire protection water system would be supplied from up to three (3) above-ground raw water storage tanks located on the sites holding up to 12,000 gallons each. In addition, each BESS container would have its own fire detection system.



Legend

- Solar Project Location
- Interstate
- US/ State Highway
- Railroad

Jurisdictional Land Ownership

- Indian Reservation

0 2 4 6 8 10

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

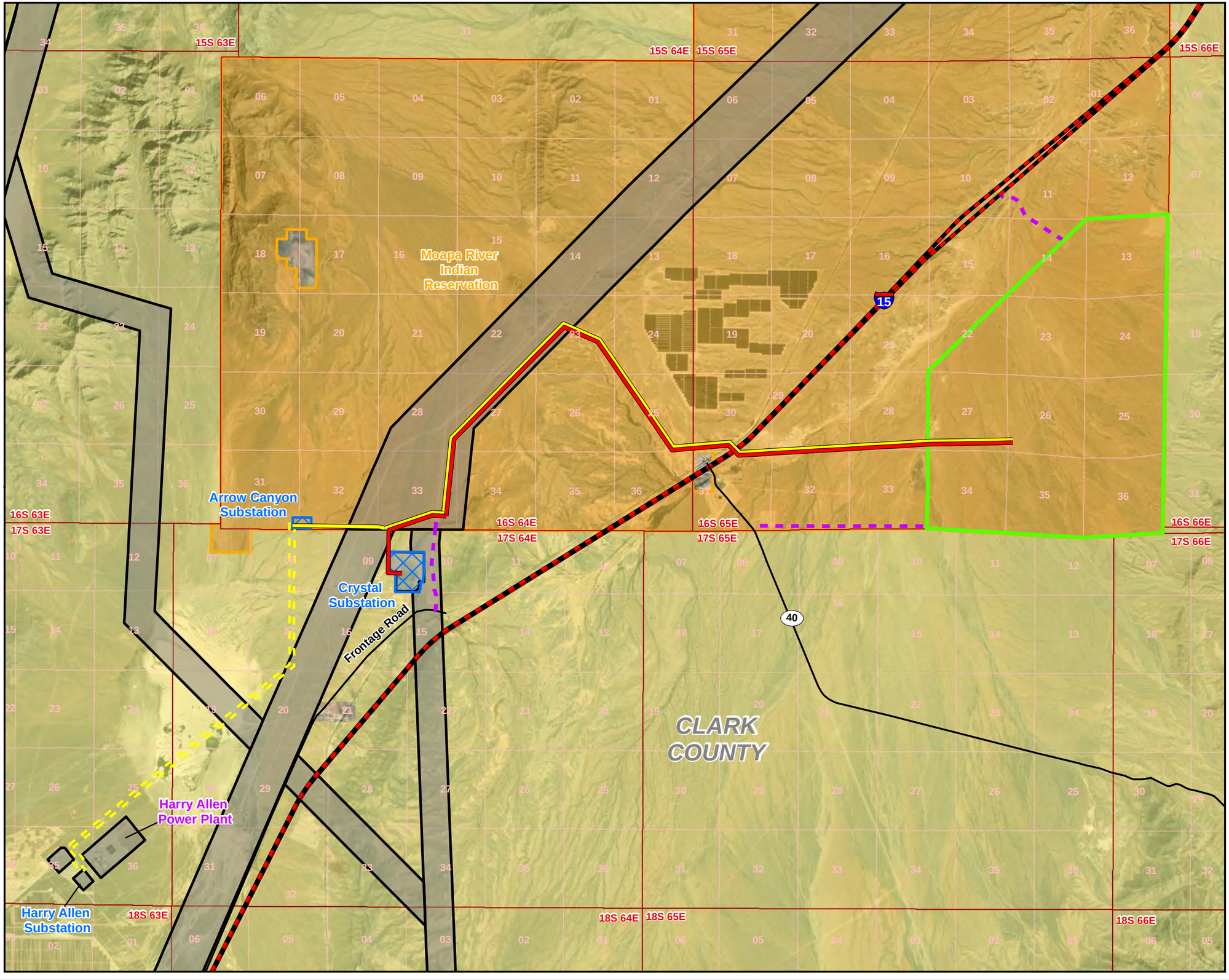
Chuckwalla Solar Projects

FIGURE 1
General Location

Map Extent: Clark County, Nevada

Date: 11-03-20		Author: rnc

G:\Chuckwalla Solar Project/MXD's/Project Location 8.5x11 110320.mxd



Legend

Project Components

- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Approved ROW Arrow Canyon - Harry Allen

General Features

- Interstate
- Major Highway
- Railroad
- Stream / River
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 0.5 1 1.5

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

Figure 2
Project Overview Map

Map Extent: Clark County, Nevada

Date: 07-26-21		Author: rnc

G:\MXD's\Project Location_072621.mxd

2.0 RAVEN MANAGEMENT

2.1 Introduction

The raven management measures provided in this section were designed to discourage the presence of common ravens and other avian scavengers by limiting the availability of anthropogenic (human-caused) food and water resources, as well as roost and nest site opportunities on the Chuckwalla Solar Projects. Implementing the raven management measures will be the responsibility of the Project owners. Responsible parties, including Field Contact Representatives, biological monitors, etc. would be determined with agency approval prior to operation of the Projects. References to "ravens" or "CORA" in this RCP should be interpreted to mean ravens and other avian scavengers.

2.2 Prevent Access to Anthropogenic Food and Water Sources

Ravens are opportunistic feeders with a varied diet and are known to make long-distance daily flights of up to 65 kilometers in a single day and several hundred kilometers over multiple days in search of food and water (Engel and Young, 1992; Boarman, 2003). Currently, garbage associated with existing land uses in the nearby city of Las Vegas provides a consistent local source of food for ravens.

Project construction activities are likely to attract ravens. To prevent the addition of food and water subsidies, as well as to avoid attracting ravens to the Project sites, the Applicant will implement the following measures: garbage management, prohibitions on intentionally feeding ravens, and limit water availability. Each of these measures is described below.

2.2.1 Garbage Management

All garbage associated with the Projects during construction and operation will be contained in secure receptacles to prevent the introduction of food resources that could potentially attract or support ravens, coyotes, and other predators or scavengers. Secure, wildlife-proof self-closing waste bins will be used during construction for all organic waste. To reduce the possibility of ravens or other scavengers, such as coyotes, from ripping into bags and exposing the garbage, plastic bags containing garbage will not be left out for pick up. All such waste material must be in secure waste bins or dumpsters at all times.

2.2.2 Prohibitions on Intentionally Feeding Ravens

Project personnel will be prohibited from intentionally feeding ravens and other wildlife on and in the vicinity of the Project sites. The Worker Environmental Awareness Program (WEAP) will inform project personnel that they are prohibited from intentionally feeding ravens and will explain why feeding wildlife is detrimental to wildlife, including sensitive species, in and around the Project sites.

2.2.3 Limit Availability of Water

Water is a valuable resource in the desert and very limited during the late spring and summer. Unnatural water sources, such as retention basins, have the potential to support a higher raven population by providing water during the driest times of the year. In order to ensure that Project activities do not create an unnatural water source during construction and operation, water will be used in a manner that does not result in ponding or puddling, excluding evaporation ponds and storm water detention/retention basins, which will be designed to eliminate standing water in the basins within several days after, including significant rain events. If evaporation ponds are required

during project construction or decommissioning phases, tortoise-proof fencing will be installed around the perimeter of each pond to prevent access by desert tortoises. All ponds will be lined. If project biologists observe evaporation ponds being utilized by ravens, ponds may need to be covered.

Truck cleaning areas will be kept free of standing water during construction. Water used for dust suppression during construction will be applied at a rate that does not result in ponding or puddling; if puddling occurs, these areas would not be watered again until dry. If PV module washing is necessary, it will be conducted in a manner that avoids ponding or puddling of water during times that ravens are active (early morning and late afternoon). During construction and operations, project personnel will immediately remove areas of ponding or puddling water.

2.3 Prevent Nesting

To prevent nesting on Project structures, the Applicant will implement the following measures:

1. **Limiting Raptor Enhancement Measures.** Utility pole construction will include raptor-friendly designs or retrofits (outlined in the Avian Power Line Interaction Committee guidelines [APLIC 2006]) that are intended to discourage or eliminate the potential for raptor nests that could also be used by ravens.

2. **Utility and building structures.** Acquire a Migratory Bird Treaty Act (MBTA) Depredation Permit in order to remove any raven nests that are found on project infrastructure. Nest removal will be at the direction of the Project's Designated Biologist, in cooperation with U.S. Fish and Wildlife Service (USFWS).

3. **Hazing**. Focus on limiting raven attractants rather than hazing. Unless implemented properly, hazing could have unintended consequences. Therefore, hazing will be implemented only under the direction of USFWS in situations where it is considered the best course of action.

4. **Structure removal following decommission.** Elevated structures including utility poles will be removed when decommissioned and dormant.

5. **Perch deterrents.** To reduce perching along segments of the onsite collector line, perch deterrents may be installed during construction. Anti-perching and nesting devices are important tools for reducing the risk of avian electrocution and keeping the entire electrical system running smoothly. These deterrents also eliminate the use of transmission lines and transmission line towers as hunting perches for raptor species, limiting the predation of other avian species or animals that use surrounding vegetation for foraging and nesting. Exact locations of perch deterrent poles would be determined in consultation with wildlife agencies prior to construction of the collector line.

6. **Annual inspections.** Inspections of utility lines and other areas where raptors or corvids (crows and ravens) might nest would be conducted annually during the breeding season. Inactive nests are not protected by the MBTA, and removal would be conducted prior to the next breeding season. Should nesting activity become a long-term issue, alternate measures to discourage nesting activities should be implemented. Prior to removing or relocating any nests, facility personnel would consult with USFWS and when necessary, proper permissions via USFWS would be obtained. Nests would be removed for the life of the project.

7. **Active raven nest buffer.** If the nesting prevention measures are inadequate and a raven nest becomes active during construction activities, an avoidance buffer of 150 feet would be delineated around the nest and the nest would be monitored to ensure construction activities are not disrupting the nest occupants. The 150-foot buffer is recommended in BLM's Nesting Bird Management Plan, Table 4-1 (Buffer Distances for Nesting Birds) (BLM 2019).

2.4 Discourage Roosting

Power poles associated with utility line structures or substations can provide roosting opportunities in areas where roosting opportunities are otherwise limited. Elevated roost locations offer ravens a view of their surroundings and prey below. If ravens are strongly attracted to the Project sites by available food and/or water sources, it will be difficult to eliminate or control perching on Project structures or other nearby structures, such as existing transmission line towers. Ravens can be very persistent, and even if Project design features effectively discourage perching on the Project sites, ravens attracted to the area will likely find other perching opportunities immediately adjacent to the Project sites. Anti-perching activities, therefore, are more focused on preventing activities that will attract ravens to the vicinity of the Projects (Boarman 2002), which include:

- **Roost prevention as a contingency.** To avoid the introduction of new roost and nest locations for ravens (and consequently non-target avian species), the Applicant will ensure perch enhancements are not installed. The SPGF will be monitored to identify frequently used locations. Contingency measures will be implemented on a case-by-case basis, in consultation with BIA, when it becomes apparent that a particular location is favorable for daytime perches or nighttime roosting. This could include, installation of triangles, plastic owls, and/or spikes to discourage nesting, per the APLIC Guidelines (APLIC 2006).
- **Structure removal following decommissioning.** All Project-related elevated structures will be removed when the Projects are decommissioned.
- **Limit speed limits to under 25 miles per hour (mph).** This would reduce the potential for roadkill, which attracts birds and increases roosting.

3.0 RAVEN MONITORING AND REPORTING

3.1 Monitoring

Raven monitoring by onsite biologists and monitors during construction and following the construction of the SPGFs. The objective of the surveys will be to characterize raven presence in the vicinity of the Projects and to monitor abundance and behavior in those areas over time. The purpose of the surveys will be to identify the local sources of human-created resources and raven activity relative to the Projects. The investigations will consist of driving surveys.

During these surveys, roads will be driven slowly (10 mph) allowing for observers to readily scan for habitats for the presence of ravens. Binoculars and spotting scopes will be used to observe raven activity within two kilometers of the sites. All raven observations will be documented, including date, time, location, habitat, number of individuals, and behavior, as well as locations of occupied and potential nests. Survey efforts will occur once monthly during the nesting season (February to August) the year following completion of construction for a total of 3 years and once annually thereafter for the duration of facility operations. Each survey visit will last two days. Each day the survey route will be driven once in the early morning (starting 30 minutes prior to sunrise), a second time in the midday (starting between noon and 2 p.m.), and a third time in the evening (completed within one hour following sunset).

If a raven or other avian scavenger nest is located, it will be monitored for signs of desert tortoise predation, if accessible. The desert tortoise mortality monitoring will cover a 30-meter radius from the nest location. This area will be walked with 10-meter belt-transects. The location of all desert tortoise carcasses or other signs of predation will be mapped and photographed and reported to the USFWS within 48 hours if dead tortoises are found during monitoring activities. Transects will be walked twice per month for as long as the nest remains active.

Incidental reporting of raven or nest sightings will also occur by biologists on the Project sites conducting clearance surveys, monitoring construction activity, monitoring environmental compliance, translocating desert tortoise, and monitoring translocated desert tortoise. Biologists will be instructed to document raven observations during those surveys. Incidental raven or desert tortoise observations will be included in the monitoring reports.

3.2 Reporting

The Applicant will submit monitoring summary reports to the BLM, BIA and USFWS on an annual basis. The report will include:

- The number and behavior of observed ravens
- Raven nest and perch locations
- Results of the management techniques
- The observed effectiveness of the techniques in minimizing raven presence
- Suggestions for improving raven management
- Wildlife mortality attributed to predators

Observations of raven predation of desert tortoise (including sign) and occupied raven nests will be reported to the designated contacts at the BLM, BIA and USFWS by an electronic mail message within two days of the observation.

3.3 Adaptive Management

The agencies will review the results of raven control efforts and in cooperation with the owner of the Projects will determine if changes in the plan are warranted following the first year of commercial operation of the Project. If the agencies determine that the raven management program is effective, and the potential for ravens to adversely affect the local wildlife population is less than significant, then the raven surveying and reporting requirement may be discontinued. Components of the Raven Control Plan, such as preventing access to anthropogenic food and water resources, preventing nesting, and discouraging roosting will remain effective throughout the lifetime of the Project.

4.0 REFERENCES

Avian Power Line Interaction Committee (APLIC). 2006. *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006*. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, California.

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Boarman, W. I. 2002. *Reducing Predation by Common Ravens on Desert Tortoises in the Mojave and Colorado Deserts*. Prepared for the United States Bureau of Land Management. United States Geological Survey Western Ecological Research Center. San Diego, California.

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Bureau of Land Management (BLM). 2019. Southern Nevada Nesting Bird Management Plan 2019. U.S. DOI, BLM Southern Nevada District, Las Vegas, Nevada. 21 pages.

Engel, K. A. and L. S. Young. 1992. Movements and habitat use by Common Ravens from roost sites in southwestern Idaho. Journal of Wildlife Management 56: 596-602.

Appendix J

Gila Monster Guidance

Appendix J

Gila Monster Guidance

NEVADA DEPARTMENT OF WILDLIFE
SOUTHERN REGION

3373 Pepper Lane, Las Vegas, Nevada 89120
Phone: 702-668-3839 or 702-486-5127; Fax: 702-486-5133

5 February 2020

GILA MONSTER STATUS, IDENTIFICATION AND REPORTING PROTOCOL FOR OBSERVATIONS

Status

- The **Gila monster (*Heloderma suspectum*) is** secretive, difficult to detect, and seemingly rare relative to other species. These attributes led the **State of Nevada** decades ago to classify the species as **Protected** (Nevada Administrative Code 503.080). Their populations are also vulnerable to poaching, the cumulative effects of habitat loss, fragmentation and degradation, and climate changes (Wildlife Action Plan Team 2012).

- Therefore, a person shall not hunt or take any protected wildlife, or possess any part thereof, without first obtaining the appropriate license, permit or written authorization from the Nevada Department of Wildlife (Nevada Administrative Codes 503.090 and 503.093).

- The USDI Bureau of Land Management has recognized this lizard as a sensitive species since 1978 and is to manage public lands in a manner to avoid the necessity of higher federal protections (BLM Manual 6840 – Special Status Species).

- In Clark County's Multiple Species Habitat Conservation Plan (MSHCP), the Gila monster is an *Evaluation Species*, meaning inadequate information exists to determine if mitigation from MSHCP implementation would demonstrably cover conservation actions necessary to ensure its persistence without additional protective intervention as provided under the federal Endangered Species Act.

- While the Gila monster is the only venomous lizard endemic to the United States, its behavioral disposition is somewhat docile and avoids confrontation. But it will readily defend itself if threatened. Most bites are considered *illegitimate*, not caused by Gila monster aggression, but resulting from human harassment or careless handling. Gila monsters are not dangerous unless molested or inappropriately handled and should never be harmed or killed.

- The Nevada Department of Wildlife (NDOW) has ongoing management studies for greatly improving our understanding specific to Nevada's banded Gila monster populations; hence, **additional sightings and descriptions for this species distribution, habitat, and biological information is of utmost interest**.

- In assistance to gathering additional information about Nevada's Gila monsters, **NDOW will be notified whenever a Gila monster is encountered or observed**, and under what circumstances (see Reporting Protocol below).

Identification

The banded Gila monster (*H. s. cinctum*) is the only wild subspecies occurring in Nevada, and is restricted to Clark, Lincoln, and Nye counties. Found mainly below 5,000 feet elevation, its geographic range approximates that of the desert tortoise (*Gopherus agassizii*) in Nevada. Gila monster habitat requirements center on complex rocky landscapes of upland desert scrub overlapping desert wash, spring, and riparian habitats, often characteristic of alluvial fans (bajadas) and adjacent rocky fields. Gila monster habitat overlaps that of both the desert tortoise and chuckwalla (*Sauromalus ater*).

Gila monsters are recognizable by a striking black and orange-pink coloration and bumpy, or beaded, skin. In keeping with its name, the banded Gila monster (shown left) retains a black chain-link, banded pattern into adulthood. Sometimes other non-venomous lizards are mistaken for the Gila monster. Of these, the western banded gecko (*Coleonyx variegatus*) and the chuckwalla are the most frequent. All three share similar habitats.

To untrained eyes, the color pattern and finely granular skin of the western banded gecko (right) may have the looks of a baby or juvenile Gila monster. But gecko heads are more pointed at the snout and the relatively large eyes have *vertical* pupils befitting their nighttime habits. Gila monsters may be both nocturnal and diurnal; the smallish eyes have *round* pupils. Snouts are bluntly rounded. Newly hatched Gila monsters vary in length at 5-7 inches with a vivid orange and black, banded pattern. Western banded geckos are generally smaller than 4 inches with cream to yellow background colors and brown to purple banded patterns.

Chuckwalla adults (left) and juveniles have a body shape somewhat suggestive of the Gila monster, but they lack the coarsely beaded skin and showy black and orange-pink body pattern. While juvenile chuckwallas can have orange and black banded tails, this colorful banding fades as chuckwallas mature. From nose to tail tip, adult chuckwallas may reach 17 inches long, rivaling that of the Gila monster. Chuckwallas are herbivorous. When alarmed, they are fast movers seeking cracks and crevices into which they can wedge themselves by inflating their bodies with air. Chuckwallas are diurnal and rock dwellers.

Reporting Protocol

Field workers (e.g. construction foremen, bio-monitors) must at least know how to: (1) identify a Gila monster by distinguishing it from other lizards like the chuckwalla and western banded gecko (see **Identification** above); (2) Report any Gila monster observation to the NDOW; (3) Be aware of the consequences of a Gila monster bite resulting from carelessness or unnecessary harassment; and, (4) Be advised of protective measures provided under state law and federal management policies.

1) Live Gila monsters found in harm's way in the construction site will be captured and then detained by the project biologist or equivalent personnel in a cool (≤85°F), shaded environment (air-conditioned vehicle or trailer is okay) until a NDOW biologist can arrive for biological documentation prior to its release Although a Gila monster is venomous and can inflict a serious bite, its relatively slow gate allows for it to be easily coaxed or carefully lifted into an open bucket or box using a long handled instrument like a snake hook, tongs, or shovel (*Note: it is not the intent to request unreasonable action to facilitate captures; additional coordination with NDOW will clarify logistical points*). For safe detainment, an unused or sterile 5-gallon plastic bucket with a secure, vented lid; an 18"x18"x4" plastic sweater box having a secure, vented lid; or, a tape-sealed cardboard box of similar dimension may be used. And, written information identifying the mapped capture location, Global Positioning System (GPS) coordinates in Universal Transverse Mercator (UTM) using North American Datum (NAD) 83 Zone 11 along with date, time, and circumstances (e.g. biological survey, construction monitoring) and habitat description (e.g. vegetation, slope, aspect, substrate) will also be provided to NDOW.

2) Injuries to Gila monsters may occur during excavation, blasting, road grading, or other construction activities. In the event a Gila monster is injured, it should be transferred to a veterinarian proficient in reptile medicine for evaluation of appropriate treatment. Therapy or euthanasia expenses will not be covered by NDOW. However, NDOW will be immediately notified of any injury to a Gila monster and which veterinarian is providing care for the animal. If an animal is killed or found dead, the carcass will be immediately frozen and transferred to NDOW with a complete written description of the discovery and circumstances, date, time, habitat, and mapped location (GPS coordinates in UTM using NAD 83 Z 11).

3) Should NDOW's assistance be delayed, biological or equivalent acting personnel on site should detain the Gila monster out of harms way until NDOW personnel can respond. **The Gila monster should be detained until NDOW biologists have responded**. Should NDOW not be immediately available to respond for photo-documentation, a digital camera (≥5 mega-pixels) will be used to take good quality images of the Gila monster *in situ* at the location of live encounter or dead salvage. The pictures will be provided to NDOW at the address above or the email address below along with specific location information including GPS coordinates in UTM using NAD 83 Z 11, date, time and habitat description. Pictures will show the following information: (1) Encounter location (landscape with Gila monster in clear view); (2) a clear overhead shot of the entire body with a ruler next to it for scale (Gila monster should fill camera's field of view and be in sharp focus); and, (3) a clear, overhead close-up of the head (head should fill camera's field of view and in sharp focus).

Please Remember: Gila monsters are considered sensitive species and sharing of observation information to sources outside of NDOW or other permitting agencies may result in adverse conservation or administrative consequences.

Contact NDOW Biologist Jason L. Jones at 702.668.3938 (office), 208-240-0194 (cell; leave message or text), 702.486.5127 (front desk) or by e-mail at jljones@ndow.org for additional information regarding these protocols.

Appendix K

Green-House Gas Calculations

Chuckwalla
Total Project Emissions

						2022 Construction Equipment Emission Factors (g/hp-hr)		Estimated Emissions (tons)		
Model Equipment Types	**Phase ID**	**Horsepower (hp)**	**Number**	**Months**	**Hours per Day**	**CO2**	**CH4**	**CO2**	**CH4**	**CO2e (metric tons)**
Forklifts	1	89	6	1	6	595.655	0.014	63.112	0.002	57.283
Generator Sets	1	84	6	1	8	595.622	0.015	79.418	0.002	72.084
Graders	1	187	6	1	8	536.403	0.013	159.222	0.004	144.517
Off-Highway Trucks	1	402	10	1	4	536.408	0.013	285.239	0.007	258.895
Carts/ATVs	1	88	8	1	8	595.622	0.015	110.933	0.003	100.689
Rollers	1	80	3	1	8	595.692	0.014	37.823	0.001	34.329
Rubber Tired Dozers	1	247	3	1	8	536.402	0.013	105.154	0.003	95.443
Scrapers	1	367	3	1	8	536.386	0.013	156.237	0.004	141.809
Tractors/Loaders/Backhoes	1	97	6	1	8	694.480	0.027	106.930	0.004	97.085
Trenchers	1	78	3	1	6	595.613	0.015	27.654	0.001	25.100
Graders	2	187	4	4	8	536.403	0.013	424.591	0.010	385.378
Off-Highway Trucks	2	402	7	4	6	536.408	0.013	1198.004	0.029	1087.358
Other Construction Equipment	2	172	2	4	6	536.333	0.015	146.431	0.004	132.915
Carts/ATVs	2	88	3	4	8	595.622	0.015	166.400	0.004	151.033
Rollers	2	80	6	4	8	595.692	0.014	302.580	0.007	274.629
Rubber Tired Dozers	2	247	4	4	8	536.402	0.013	560.822	0.014	509.028
Scrapers	2	367	4	4	8	536.386	0.013	833.262	0.021	756.316
Aerial Lifts	3	63	2	1	8	595.618	0.015	19.854	0.000	18.021
Cranes	3	231	2	1	8	530.598	0.013	64.852	0.002	58.864
Crawler Tractors	3	212	2	1	8	536.402	0.013	60.169	0.001	54.612
Forklifts	3	89	2	1	8	595.655	0.014	28.050	0.001	25.459
Generator Sets	3	84	2	1	8	595.622	0.015	26.473	0.001	24.028
Off-Highway Trucks	3	402	3	1	4	536.408	0.013	85.572	0.002	77.668
Carts/ATVs	3	88	2	1	8	595.622	0.015	27.733	0.001	25.172
Tractors/Loaders/Backhoes	3	97	2	1	8	694.480	0.027	35.643	0.001	32.362
Graders	4	187	4	2	8	536.403	0.013	212.296	0.005	192.689
Off-Highway Trucks	4	402	8	2	6	536.408	0.013	684.573	0.017	621.347
Carts/ATVs	4	88	4	2	8	595.622	0.015	110.933	0.003	100.689
Rollers	4	80	4	2	8	595.692	0.014	100.860	0.002	91.543
Tractors/Loaders/Backhoes	4	97	4	2	8	694.480	0.027	142.574	0.006	129.447
Air Compressors	5	78	2	2	4	595.622	0.015	24.582	0.001	22.312
Cranes	5	231	1	2	8	530.598	0.013	64.852	0.002	58.864
Generator Sets	5	84	2	2	4	595.622	0.015	26.473	0.001	24.028
Graders	5	187	1	2	8	536.403	0.013	53.074	0.001	48.172
Other Equipment	5	172	1	2	8	536.333	0.015	48.810	0.001	44.305
Welders	5	46	1	2	2	595.719	0.013	3.625	0.000	3.290
Aerial Lifts	6	63	3	2	8	595.618	0.015	59.563	0.001	54.063
Cranes	6	231	2	2	8	530.598	0.013	129.705	0.003	117.728
Forklifts	6	89	2	2	6	595.655	0.014	42.075	0.001	38.189
Off-Highway Trucks	6	402	2	2	4	536.408	0.013	114.096	0.003	103.558
Carts/ATVs	6	88	2	2	8	595.622	0.015	55.467	0.001	50.344
Tractors/Loaders/Backhoes	6	97	5	2	6	694.480	0.027	133.663	0.005	121.357
Trenchers	6	78	5	2	6	595.613	0.015	92.180	0.002	83.668
Tractors/Loaders/Backhoes	7	97	3	3	8	694.480	0.027	160.395	0.006	145.628
Graders	8	187	6	2	8	536.403	0.013	318.443	0.008	289.034
Off-Highway Trucks	8	402	10	2	6	536.408	0.013	855.717	0.021	776.684
Other Construction Equipment	8	172	4	2	6	536.333	0.015	146.431	0.004	132.915
Carts/ATVs	8	88	10	2	8	595.622	0.015	277.333	0.007	251.722
Rollers	8	80	6	2	8	595.692	0.014	151.290	0.004	137.315
Rubber Tired Dozers	8	247	6	2	8	536.402	0.013	420.617	0.010	381.771
Scrapers	8	367	4	2	8	536.386	0.013	416.631	0.010	378.158
Tractors/Loaders/Backhoes	8	97	6	2	8	694.480	0.027	213.860	0.008	194.171
Forklifts	9	89	8	10	8	595.655	0.014	1121.998	0.027	1018.373
Generator Sets	9	84	16	10	8	595.622	0.015	2117.815	0.053	1922.242
Off-Highway Trucks	9	402	10	10	6	536.408	0.013	4278.584	0.104	3883.421
Carts/ATVs	9	88	15	10	8	595.622	0.015	2079.997	0.052	1887.917
Rollers	9	80	3	10	6	595.692	0.014	283.669	0.007	257.465
Skid Steers	9	65	15	10	8	693.913	0.024	1789.893	0.062	1624.937
Post Drivers	9	65	18	10	8	595.618	0.015	1843.619	0.046	1673.376
Tractors/Loaders/Backhoes	9	97	3	10	6	694.480	0.027	400.988	0.016	364.070
Trenchers	9	78	8	10	8	595.613	0.015	983.255	0.025	892.458
Project Total Emissions								**25072.094**	**0.652**	**22757.330**

Notes:
(1) Construction equipment emission factors developed using EPA MOVES2014a-20151201 model for nonroad sources for 2022.
(2) Nitrous oxide (N2O) not calculated, assumed to be negligible.

Chuckwalla
Annual Project Emissions

Model Equipment Types (3)	Phase ID	Year 1 Factor	Year 2 Factor	CO2e (metric tons) Year 1	CO2e (metric tons) Year 2
Forklifts	1	1	0	57.283	0.000
Generator Sets	1	1	0	72.084	0.000
Graders	1	1	0	144.517	0.000
Off-Highway Trucks	1	1	0	258.895	0.000
Carts/ATVs	1	1	0	100.689	0.000
Rollers	1	1	0	34.329	0.000
Rubber Tired Dozers	1	1	0	95.443	0.000
Scrapers	1	1	0	141.809	0.000
Tractors/Loaders/Backhoes	1	1	0	97.085	0.000
Trenchers	1	1	0	25.100	0.000
Graders	2	1	0	385.378	0.000
Off-Highway Trucks	2	1	0	1087.358	0.000
Other Construction Equipment	2	1	0	132.915	0.000
Carts/ATVs	2	1	0	151.033	0.000
Rollers	2	1	0	274.629	0.000
Rubber Tired Dozers	2	1	0	509.028	0.000
Scrapers	2	1	0	756.316	0.000
Aerial Lifts	3	1	0	18.021	0.000
Cranes	3	1	0	58.864	0.000
Crawler Tractors	3	1	0	54.612	0.000
Forklifts	3	1	0	25.459	0.000
Generator Sets	3	1	0	24.028	0.000
Off-Highway Trucks	3	1	0	77.668	0.000
Carts/ATVs	3	1	0	25.172	0.000
Tractors/Loaders/Backhoes	3	1	0	32.362	0.000
Graders	4	1	0	192.689	0.000
Off-Highway Trucks	4	1	0	621.347	0.000
Carts/ATVs	4	1	0	100.689	0.000
Rollers	4	1	0	91.543	0.000
Tractors/Loaders/Backhoes	4	1	0	129.447	0.000
Air Compressors	5	1	0	22.312	0.000
Cranes	5	1	0	58.864	0.000
Generator Sets	5	1	0	24.028	0.000
Graders	5	1	0	48.172	0.000
Other Equipment	5	1	0	44.305	0.000
Welders	5	1	0	3.290	0.000
Aerial Lifts	6	0.778	0.222	42.049	12.014
Cranes	6	0.778	0.222	91.566	26.162
Forklifts	6	0.778	0.222	29.703	8.486
Off-Highway Trucks	6	0.778	0.222	80.545	23.013
Carts/ATVs	6	0.778	0.222	39.157	11.188
Tractors/Loaders/Backhoes	6	0.778	0.222	94.389	26.968
Trenchers	6	0.778	0.222	65.075	18.593
Tractors/Loaders/Backhoes	7	0.778	0.222	113.266	32.362
Graders	8	0.778	0.222	224.804	64.230
Off-Highway Trucks	8	0.778	0.222	604.088	172.597
Other Construction Equipment	8	0.778	0.222	103.378	29.537
Carts/ATVs	8	0.778	0.222	195.784	55.938
Rollers	8	0.778	0.222	106.800	30.514
Rubber Tired Dozers	8	0.778	0.222	296.933	84.838
Scrapers	8	0.778	0.222	294.123	84.035
Tractors/Loaders/Backhoes	8	0.778	0.222	151.022	43.149
Forklifts	9	0.200	0.800	203.675	814.698
Generator Sets	9	0.200	0.800	384.448	1537.794
Off-Highway Trucks	9	0.200	0.800	776.684	3106.737
Carts/ATVs	9	0.200	0.800	377.583	1510.333
Rollers	9	0.200	0.800	51.493	205.972
Skid Steers	9	0.200	0.800	324.987	1299.950
Post Drivers	9	0.200	0.800	334.675	1338.701
Tractors/Loaders/Backhoes	9	0.200	0.800	72.814	291.256
Trenchers	9	0.200	0.800	178.492	713.966

Annual Total Tons (MMCO2e)

Year 1	Year 2
0.011	0.012

Nevada 2017 Gross Tons (MMCO2e) 43.813
Nevada 2017 Net Tons (MMCO2e) 38.066

Project Percent of Nevada 2017 Net Emissions

Year 1	Year 2
0.029%	0.030%

Appendix L

BLM Sensitive Species

Chuckwalla Solar Projects

BLM SENSITIVE SPECIES AND NEVADA STATE-LISTED SPECIES

The following table was compiled using species lists from the five previous environmental impact statements (EISs) for solar projects on the Reservation (Southern Paiute Solar Project [Bureau of Indian Affairs (BIA) 2012: pages 3-47 through 3-51]; Moapa Solar Energy Center [BIA 2014: pages 3-33 through 3-36 and 3-43 through 3-46]; Aiya Solar Project [BIA 2016: pages 3-28 through 3-43], Eagle Shadow Mountain Solar Project [BIA 2019: pages 3-24 through 3-35]; and Southern Bighorn I and II Solar Projects [BIA 2021: pages 3-27 through 3-34]), the Nevada Natural Heritage Program (NNHP) Species List tool (http://heritage.nv.gov/species/lists.php), the NNHP Plant and Animal Watch List (NNHP 2021a), and the NNHP At-Risk Plant and Animal Tracking List (NNHP 2021b). Only species with the potential to occur within the Project area for the Chuckwalla Solar Projects are included in **Table L-1**.

Table L-1. Nevada State-listed and BLM Sensitive Plants and Wildlife

Scientific Name	Common Name	Status	Potential to Occur in Project Area	Habitat
Birds				
Aquila chrysaetos	Golden eagle	NNHP, BLM Sensitive, BGEPA, MSHCP	Low potential to occur. Foraging habitat within the Project areas. No breeding habitat present, with nearest 10 miles to the north and west ofthe Projects.	Prefers open country, especially around mountains, hills, and cliffs; use a variety of habitats ranging from arctic to desert,including tundra, shrublands, grasslands,farmland, and area along rivers and streams. Nests in cliff habitat or tall trees.
Athene cunicularia hypugaea	Western burrowing owl	NNHP, BLM Sensitive, MSHCP	High potential to be present within or near Project areas. Nesting and foraging habitat present. Sign was observed on four burrows but no owls were seen during surveys of the Project areas.	Open habitats, sparse vegetation such as prairie, pastures, desert or shrub-steppe,and airports. Associated with prairie dogsand ground squirrels, whose burrows they use for nests.
Auriparus flaviceps	Verdin	NNHP	High potential foraging and nesting habitat within and near the Project areas. Potential nesting habitat along ephemeral washes.	Inhabits desert regions of the U.S. and northern Mexico. Found wherever thornyscrub vegetation is present and prefer to nest in acacias (*Acacia* spp.), paloverde (*Cercidium* spp.), smoke tree (*Dalea spinosa*), mesquite (*Prosopis* spp.), or desert lavender (*Hyptis emoryi*).

Table L-1. Nevada State-listed and BLM Sensitive Plants and Wildlife				
Scientific Name	**Common Name**	**Status**	**Potential to Occur in Project Area**	**Habitat**
Buteo regalis	Ferruginous hawk	NNHP, BLM Sensitive, MSHCP	Low potential, little suitable habitat present.	Open grasslands, sagebrush flats, low foothills, and fingers of pinyon-juniper habitat. Rock outcrops and isolated trees are used for nesting.
Buteo swainsoni	Swainson's hawk	NNHP, BLM Sensitive	Low potential. No suitable habitat.	Agricultural valleys with cotton, elm, orother suitable nest trees. Nests in scattered trees.
Charadrius alexandrines nivosus	Western snowy plover	NNHP, BLM Sensitive	Low potential. No suitable habitat.	Beaches, dry mud or salt flats, sandyshores of rivers, lakes, and ponds. Nests on the ground within these habitats.
Falco peregrinus	Peregrine falcon	NNHP, BLM Sensitive, MSHCP	Low potential. Little suitable foraging habitat and no breeding habitat.	Mountains, open forested regions, andhuman population centers. Nests primarily on cliffs but also on tall buildings.
Gymnorhinus cyanocephalus	Pinyon jay	BLM Sensitive	Low potential. No suitable habitat.	Pinyon-juniper woodland, less frequently pine, also occurs in scrub oak and sagebrush.
Hailiaeetus leucocephalus	Bald eagle	BLM Sensitive, BGEPA	Low potential. No suitable habitat.	Large bodies of water for feeding.Mature trees for roosting/nesting.
Ixobrychus exilis	Least bittern	NNHP, BLM Sensitive	Low potential. No suitable habitat.	Fresh marshes, reedy ponds. Mostly freshwater but also brackish, in areas with tall, dense vegetation standing inwater.
Lanius ludovicianus	Loggerhead shrike	NNHP, BLM Sensitive, MSHCP	High potential. Foraging and nesting habitat within and near the Project areas.	Open country with short vegetation andwell-spaced shrubs or low trees, with spines or thorns; frequents agricultural fields, pastures, old orchards, riparian areas, desert scrub, savannas, prairies, golf courses, and cemeteries. Prefers open habitat with perches for hunting and dense shrubs for nesting.
Melanerpes lewis	Lewis' woodpecker	NNHP, BLM Sensitive	Low potential. No suitable habitat.	Open forest and woodland, often loggedor burned, including oak, coniferous forest.
Phainopepla nitens	Phainopepla	NNHP, BLM Sensitive, MSHCP	Moderate potential to occur within or near the Project areas. Couldnest in the desert wash and mesquite bosque habitats in the vicinity of the Projects.	Desert, riparian woodlands, and chaparral. Depend on fruiting desert mistletoe (*Phoradendron californicum*), which parasitizes the same trees used fornesting, and produces a stable, long-lasting supply of berries.

Table L-1. Nevada State-listed and BLM Sensitive Plants and Wildlife				
Scientific Name	**Common Name**	**Status**	**Potential to Occur in Project Area**	**Habitat**
Psiloscops flammeolus	Flammulated owl	BLM Sensitive	Low potential. No suitable habitat.	Open pine forests in mountains. Nests typically in ponderosa pine in cool, fairly dry zones. In some areas favors aspen groves. Can be found in dense thickets at lower elevations.
Spizella breweri	Brewer's sparrow	NNHP, BLM Sensitive	Low potential. Little suitable habitat present.	Strongly associated with sagebrush in areas with scattered shrubs and short grass. Nests in tall, dense shrubs.
Toxostoma bendirei	Bendire's thrasher	NNHP, BLM Sensitive, MSHCP	High potential to occur within or near the Project areas, nesting habitat occurs within Project areas.	Found in desert habitats, especially areasof tall vegetation, cholla cactus (*Cylindropuntia* spp.), creosotebush (*Larrea tridentata*), and yucca (*Yucca* spp.), and in juniper woodland, where they nest in shrubs, yucca, and trees.
Toxostoma crissale	Crissal thrasher	BLM Sensitive	Moderate potential to occur and nest within or near the Project areas. Suitable habitat occurs in Project areas.	Dense brush along desert streams, mesquite thickets. Habitat varies from dense mesquite along washes to sparsebrush in open areas. Also in chaparral, manzanita, and other scrub. Nests in dense shrubs.
Toxostoma lecontei	LeConte's thrasher	NNHP, BLM Sensitive, MSHCP	Moderate potential to occur and nest within or near the Project areas. Suitable habitat occurs in Project areas.	Found in desert scrub, mesquite, tallriparian brush, and chaparral. Rarelyoccurs in habitats consisting of predominantly creosotebush. Nests in thick, dense, thorny shrubs and cacti.
Mammals				
Antrozous pallidus	Pallid bat	NNHP, BLM Sensitive	Low potential to occur. Reliance on tree roosts.	Arid deserts and grasslands. Shallowcaves and crevices, rock outcrops buildings, and tree cavities are used for roosting.
Corynorhinus townsendii	Townsend's big-eared bat	NNHP, BLM Sensitive	Low potential to occur. Mine and cave obligates. No suitable habitat.	Salt desert scrub, sagebrush and pinyon-juniper, mahogany. Will not live in extreme desert environments. Roosts in caves and mines.
Euderma maculatum	Spotted bat	NNHP, BLM Sensitive	Low potential to occur, prefers riparian areas for foraging.	Desert scrub to forest habitats. Roosts in caves and crevices.
Idionycteris phyllotis	Allen's big-eared bat	NNHP, BLM Sensitive	Low potential to occur. Prefers high coniferous forest.	Uses a variety of habitats including Mojave desert scrub, coniferous forests,and riparian woodlands, but prefers mountainous desert regions
Lasiurus blossevillii	Western red bat	NNHP, BLM Sensitive	Low potential to occur. No suitable habitat.	Woodland habitats, Muddy River area. Roosts in tree foliage.

Table L-1. Nevada State-listed and BLM Sensitive Plants and Wildlife				
Scientific Name	**Common Name**	**Status**	**Potential to Occur in Project Area**	**Habitat**
Mactrous californicus	California leaf-nosed bat	NNHP, BLM Sensitive	Low potential to occur. Occurs at lower elevations.	Inhabits low deserts, caves, mines, buildings usually within Sonoran desert scrub.
Myotis californicus	California myotis	BLM Sensitive	Moderate potential to occur. Common, may forage within the Project areas.	Semiarid deserts and grasslands, forests, coastal forests, and montane forests. Nest in tree bark and rock crevices.
Myotis thysanodes	Fringed myotis	NNHP, BLM Sensitive	Low potential to occur. Reliance on cave roosts.	Low desert scrub to high elevationconiferous forests. Roosts in caves, mines, and occasionally buildings.
Myotis velifer	Cave myotis	BLM Sensitive	Low potential to occur. Rare.	Cave dwelling; will roost in rock or wallcrevices, old buildings, and under bridges.
Nyctinomops macrotis	Big free-tailed bat	BLM Sensitive	Low potential to occur. Rare.	Inhabits rocky terrain, roosts in rocky cliffs in weathered rock fissures and crevices. Also roost in buildings and plants including pines and desert shrubs.
Pipistrellus hesperus	Western pipistrelle	BLM Sensitive	Moderate potential to occur. Common.	Desert habitats of blackbrush, creosotebush, salt desert shrub, andsagebrush. Nests in caves and under loose rocks.
Tadarida brasiliensis	Brazilian free-tailed bat	NNHP, BLM Sensitive	Moderate potential to occur. Abundant species in southern Nevada.	Roosts in caves and manmade structures.Found from low desert to high mountains.
Vulpes macrotis	Desert kit fox	NNHP, BLM Sensitive	Moderate potential to occur. Suitable habitat is present within the Project areas.	Widely distributed throughout the arid southwest and can be found in a variety of habitat types. Kit foxes rely on dens throughout the year for rest sites, shelteragainst harsh weather, as bearing and rearing locations for young, and as an escape from predators. They can dig their own dens but will often enlarge existing dens that were made by badgersor rodents. Also known to use exposed/protected pipes or smaller culverts which provide protection from predators, harsh conditions, and temporary and maternal dens.
Reptiles				

Table L-1. Nevada State-listed and BLM Sensitive Plants and Wildlife				
Scientific Name	**Common Name**	**Status**	**Potential to Occur in Project Area**	**Habitat**
Heloderma suspectum cinctum	Gila monster	NNHP, BLM Sensitive, MSHCP	Moderate potential to occur. Suitable habitat is present within the Project areas.	Occurs in Clark, Lincoln, and Nye countiesin Nevada. Found mainly below 5,000 feet, its geographic range approximates that of the desert tortoise and is coincident to the Colorado River drainage. Occurs in desert wash, spring, and riparian habitats that inter-digitate primarily with complex rocky landscapesof upland desert scrub. They will use and are occasionally encountered out in gentler terrain of alluvial fans (bajadas). Gila monsters are secretive and difficult to locate, spending greater than 95 percent of their lives underground.
Dipsosaurus dorsalis	Desert iguana	NNHP, BLM Sensitive	Moderate potential to occur. Suitable habitat is present within the Project areas.	Inhabits creosotebush scrub from belowsea level to 3,300 feet. It prefers hummocks of loose sand and patches of firm ground with scattered rocks, as wellas desert washes.
Plants				
Arctomecon merriamii	White bear poppy	NNHP, BLM Sensitive	Low potential to occur based on habitat models (Hamilton and Kokos 2011).	An evergreen perennial herb that bloomsfrom April through July. Found in Nevadafrom Clark, Nye, and Lincoln counties on a wide variety of dry to sometimes moist basic soils, including alkaline clay and sand, gypsum, calcareous alluvial gravels,and carbonate rock outcrops in chenopod scrub and rocky Mojave Desert communities from 1,600 to 6,280 feet. Suitable habitat for this species is limitedto the badland soil types.
Astragalus geveri var. triquetrus	Three corner milkvetch	NNHP, BLM Sensitive	Low potential to occur based on habitat models (Hamilton and Kokos 2011). Deep sandy soil or dunes are not present.	Short, spindly, but upright annual forb with pinnately divided leaves. Requires open, deep sandy soil or dunes, generallystabilized by vegetation and/or a gravel veneer and is dependent on sand dunes or deep sand in Nevada.
Astragalus nyensis	Nye milkvetch	NNHP	Moderate potential to occur. Suitable habitat is present.	Found in the foothills of desert mountains, calcareous outwash fans andgravelly flats, and sometimes in sandy soil. Associated plants are creosotebush,white bursage, and cheesebush.

Table L-1. Nevada State-listed and BLM Sensitive Plants and Wildlife				
Scientific Name	**Common Name**	**Status**	**Potential to Occur in Project Area**	**Habitat**
Eriogonum corymbosum var. nilesii	Las Vegas buckwheat	NNHP, BLM Sensitive	Low potential to occur. Nearest potentially suitable habitat based off Hamilton 2019 models is 0.6 mile south of the SBSPs.	Found in sandy substrates comprised mainly of gypsum. In 2008, the USFWS considered protecting the Las Vegas buckwheat under the ESA but determined it does not warrant protection. GIS models to understand distribution of plant and suitable habitat(gypsiferous soils) were developed (Hamilton and Kokos 2011; Hamilton 2019).
Eriogonum viscidulum	Sticky buckwheat	NNHP, BLM Sensitive	Low potential to occur within the Project area. No suitable habitat.	A tall, erect, and spreading annual, 1.6 to 13.1 feet (0.5 to 4 meters) high and minutely viscid. Leaves are basal with leaf blades being elliptic to broadly ovate. This buckwheat is found in Clark and Lincoln counties, Nevada and northwestern Arizona (NNHP 2001). Populations occur along the Muddy Riverfrom Weiser Wash to its confluence with the Virgin River and within the Virgin River drainage. This species overlaps withthree-corner milkvetch over much of its range. Requires sandy soil or dunes.
Pediomelum castoreum	Beaver Dam breadroot	NNHP, BLM Sensitive	Low potential to occur based on habitat models (Hamilton and Kokos 2011).	Beaver Dam breadroot has been recorded in Nevada at elevations from 1,280 to 5,000 feet and is found in sandor sandy gravel in open areas and alongroadsides (NNHP 2001).
Penstemon bicolor ssp. Roseus	Rosy two-tone beardtongue	NNHP, BLM Sensitive	Moderate potential to occur. Suitable habitat is present within the Project areas.	Perennial herb known in Nevada from Clark and Nye counties. Found on rocky,calcareous, granitic, or volcanic soils in washes, roadsides, scree at outcrop bases, rock crevices, or similar places receiving enhanced runoff in creosote- bursage, blackbrush, mixed-shrub, Joshua tree woodland, and Mojave Desert communities from 1,800 to 4,084 feet.

Table L-1. Nevada State-listed and BLM Sensitive Plants and Wildlife				
Scientific Name	**Common Name**	**Status**	**Potential to Occur in Project Area**	**Habitat**
Yucca schidigera	Mojave yucca	NAC 527	High potential to occur within the Project area. Common in the area.	Common in creosote desert flats. Provides browse for several wildlife species during spring, summer, and fall. Flower stalks and foliage are palatable to rodents and some wild ungulates during much of the year (USDA 2020) and it provides shelter and shade for many mammals, birds, and reptiles. There is an obligate, mutualistic relationship between the Mojave yucca and the small white yucca moth (*Tegeticula yuccasella*).

Abbreviations: BCC = BGEPA = Bald and Golden Eagle Protection Act; BLM = Bureau of Land Management; ESA = Endangered Species Act; MSHCP = Multiple Species Habitat Conservation Plan ; NAC 527 = Nevada Administrative Code 527, Protection and Preservation of Timbered Lands, Trees, and Flora; NNHP = Nevada Natural Heritage Program; USDA = U.S. Department of Agriculture Forest Service

Appendix M

Biological Assessment

Biological Assessment

Chuckwalla Solar Projects

Prepared for:

Bureau of Indian Affairs Western Regional Office

2600 N. Central Avenue

Phoenix, AZ 85004-3050

January 2022

TABLE OF CONTENTS

1 INTRODUCTION

The purpose of this Biological Assessment (BA) is to review the Chuckwalla Solar Projects (Chuckwalla or Projects) and to determine to what extent the Projects would affect federally listed threatened or endangered species; species proposed for listing; and/or designated or proposed critical habitat. The Projects would use land held in trust by the Bureau of Indian Affairs (BIA) for the benefit of the Moapa Band of Paiutes (Moapa Band), a designated utility corridor on Reservation lands that is managed by the Bureau of Land Management (BLM), and BLM-managed land near the Crystal Substation.

The proposed Projects would be located approximately 30 miles northeast of Las Vegas in Clark County, Nevada (**Figure 1-1**). The lease study area for the Chuckwalla Projects would be located on up to 6,437 leased acres on the Reservation in Sections 13, 14, 22, 23, 24, 25, 26, 27, 34, 35, and 36 of Township 16 South, Range 65 East; and the off-site Project components, including the generation interconnection (gen-tie) lines, site access roads, the temporary water pipeline, and the existing road that provides access to the gen-tie line would be located in Sections 10, 11, 14, 28, 29, 30, 31, 32, and 33 of Township 16 South, Range 65 East, Sections 22, 23, 24, 25, 27, 28, 31, 32, and 33 of Township 16 South, Range 64 East, and Sections 9, 10, and 15 of Township 17 South, Range 64 East, Mount Diablo Base Meridian.

The gen-tie lines would exit the lease study area on the west side and travel approximately 5.5 miles to the BLM-managed designated utility corridor then approximately 4.5 miles southwest. At this point, one line will continue west to the planned Arrow Canyon Solar Project (ACSP) site substation and one line will continue south through BLM-managed lands south of the Reservation to the existing Crystal Substation. **Figure 1-2** shows the location of the proposed components of the Projects and associated facilities. Project components would include onsite facilities, offsite facilities, and temporary facilities needed to construct the Projects.

The proposed access roads would use existing roads that exit the lease study area in the southwest corner and the northwest corner. The southwest road connecting the Projects to Valley of Fire Highway will need to be upgraded, while the northwest road connecting the Projects to Highway 15 will not require upgrades.

The majority of the Projects are located on Reservation land. A portion of the gen-tie lines is located on Reservation land but is within a designated utility corridor that is managed by the BLM. A portion of one of the gen-tie lines and the existing road that provides access to the gen-tie line are located on lands administered by the BLM. As such, this BA has been prepared in coordination with both BIA and BLM for submittal to the U.S. Fish and Wildlife Service (USFWS).

1.1 Project Overview

EDFR LLC (“Applicant”), a subsidiary of EDF, proposes to construct, operate, maintain, and decommission the Projects, consisting of up to a 700-megawatt (MW) alternating current (AC) solar photovoltaic (PV) power generating facility (four solar fields) on approximately 6,500 acres of land on the Moapa River Indian Reservation (Reservation) in Clark County, Nevada (**Figure 1-1**). Major Project components include the following:

- Solar fields
- Battery Energy Storage System (BESS)

- Gen-tie lines
- Site fencing
- Site substations
- Communications systems infrastructure
- Operation and maintenance (O&M) area
- Access roads and internal site roads

A complete description of the Projects is presented in Chapter 2 of this BA.

Power produced by the Projects would be conveyed either to the previously approved Arrow Canyon substation or the Crystal Substation. From the ACSP substation, the electricity generated would connect to the approved MSEC Project gen-tie line to the Harry Allen Substation.

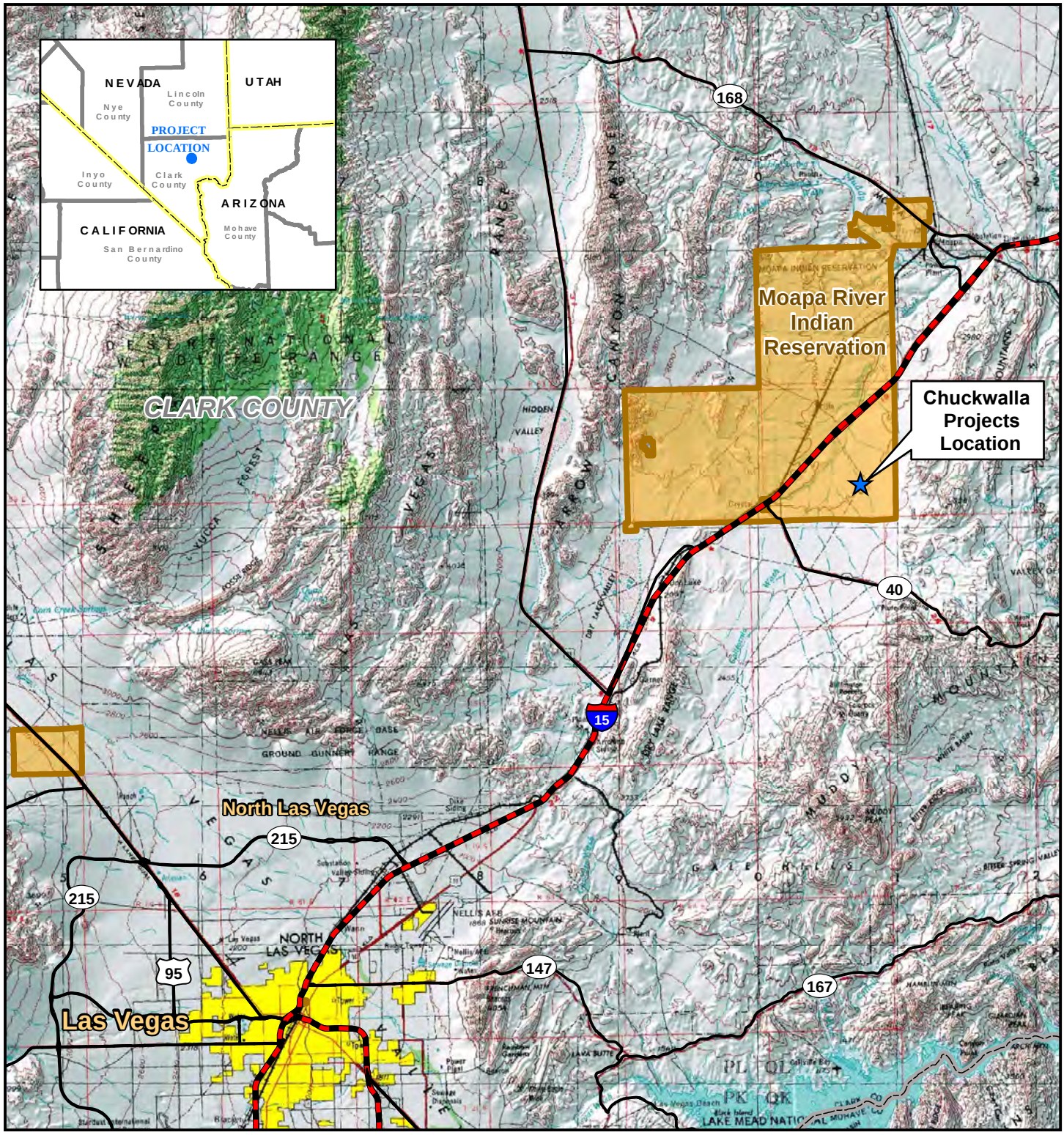
1.2 Consultation History

On September 23, 2021, an official list of species that may occur within the Project area was obtained from the USFWS website Information for Planning and Consultation System (IPaC) (Consultation Code: 08ENVS00-2021-SLI-0229)(**Appendix A**); additional species were considered due to proximity to the Project areas (USFWS 2021a). **Table 1-1** lists these species, their status, critical habitat (if any) and proximity of the same to the proposed Project areas, and the recommended effects determination.

The BIA met with USFWS on June 8, 2021, via teleconference, to discuss the Section 7 process, timing, BA format, options for Mojave desert tortoise (*Gopherus agassizii*) relocation and potential project designs that would minimize impacts to desert tortoise (i.e., avoidance and minimization measures). Attendees included Glen Knowles (USFWS Las Vegas Field Office), Kelly Douglas (USFWS Las Vegas Field Office), Chip Lewis (BIA), Randy Schroeder (ENValue) and Patrick Golden (Heritage).

The BIA met with USFWS on September 28, 2021, via teleconference, to discuss the Section 7 process possible scenarios for translocation of desert tortoise and the preparation of Desert Tortoise Translocation Plans (DDTPs) for the Projects. Attendees included Glen Knowles (USFWS Las Vegas Field Office), Kelly Douglas (USFWS Las Vegas Field Office), Kim Fields (USFWS Desert Tortoise Recovery Office), Chip Lewis (BIA), Randy Schroeder (ENValue) and Patrick Golden (Heritage).

The BIA met with USFWS and BLM On October 6, 2021, via teleconference, to discuss details regarding relocating tortoises within approximately 500 meters of the fenceline over the fence onto BLM-administered lands. Attendees included Glen Knowles (USFWS Las Vegas Field Office), Kelly Douglas (USFWS Las Vegas Field Office), Chip Lewis (BIA), Mark Slaughter (BLM Southern Nevada Field Office), Randy Schroeder (ENValue) and Patrick Golden (Heritage).



Legend

- Solar Project Location
- Interstate
- US/ State Highway
- Railroad

Jurisdictional Land Ownership

- Indian Reservation

0 2 4 6 8 10

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

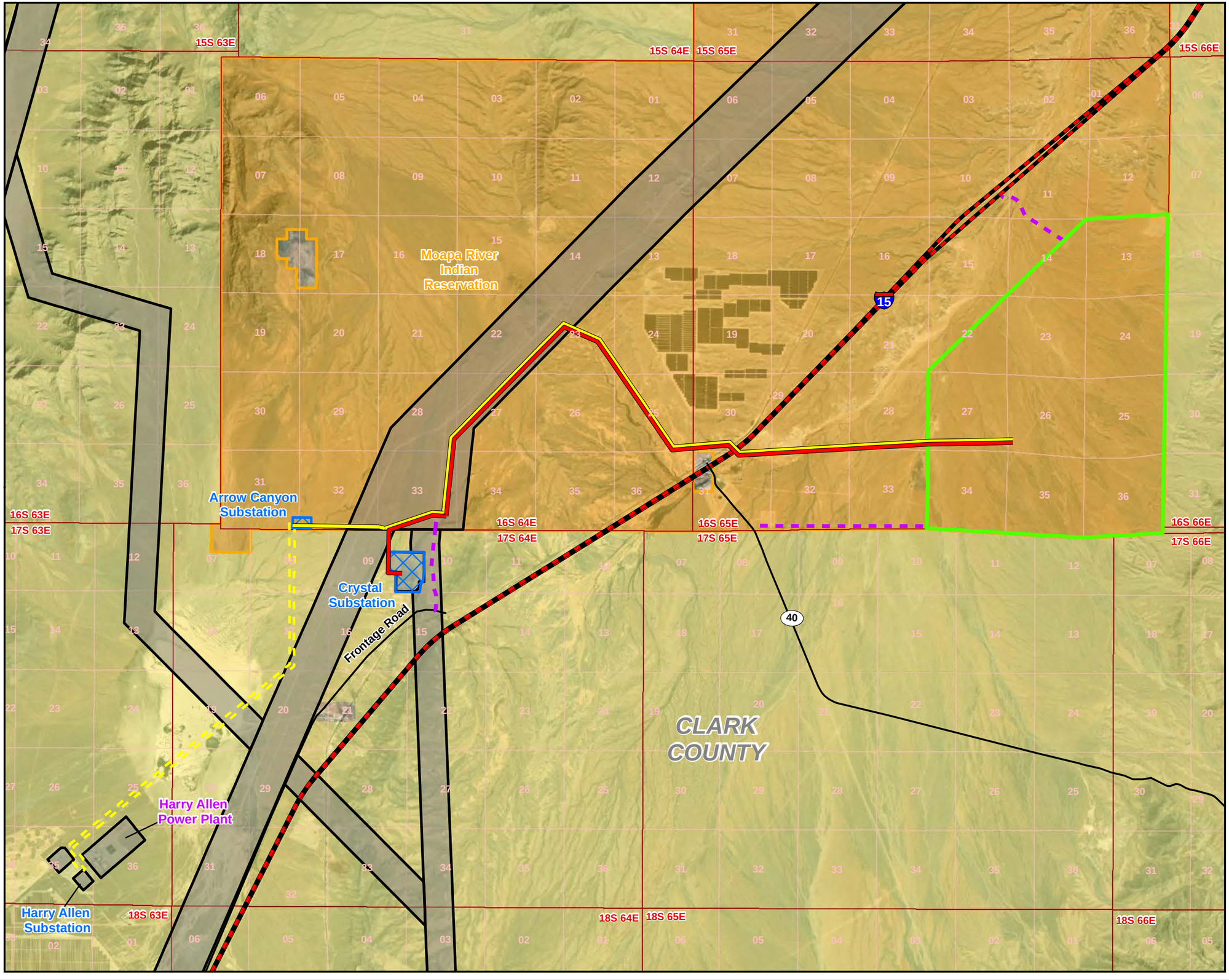
Chuckwalla Solar Projects

FIGURE 1-1
General Location

Map Extent: Clark County, Nevada

Date: 11-03-20		Author: rnc

G:\Chuckwalla Solar Project/MXD's/Project Location 8.5x11 110320.mxd



Legend

Project Components

- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Approved ROW Arrow Canyon - Harry Allen

General Features

- Interstate
- Major Highway
- Railroad
- Stream / River
- Existing Substation
- Designated Utility Corridor
- Township
- Section

Land Jurisdiction

- Bureau of Land Management Land
- Indian Land

0 0.5 1 1.5

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

Figure 1-2
Project Overview Map

Map Extent: Clark County, Nevada

Date: 07-26-21		Author: rnc

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Table 1-1 - LISTED SPECIES CONSIDERED			
Species	**Status**	**Critical Habitat/Location**	**Recommended Determination of Effects**
Birds			
Yellow-billed cuckoo (*Coccyzus americanus*) Population: Western U.S. Distinct Population Unit	Threatened	USFWS Designated Critical Habitat approximately 135 miles south-southeast of the Project areas	*May affect, not likely to adversely affect*
Yuma Ridgway's (Clapper) rail (*Rallus longirostris yumanensis*) Population: U.S. only	Endangered	No USFWS Designated Critical Habitat	*May affect, not likely to adversely affect*
Southwestern willow flycatcher (*Empidonax trailii extimus*)	Endangered	USFWS Designated Critical Habitat approximately 17 miles east of the Project areas	*May affect, not likely to adversely affect* *No effect to designated critical habitat*
Reptiles			
Mojave desert tortoise (*Gopherus agassizii*)	Threatened	USFWS designated Critical Habitat approximately 12 miles west of the Project areas	*May affect, likely to adversely affect* *No effect to designated critical habitat*
Fish			
Moapa dace (*Moapa coriacea*)	Endangered	No USFWS Designated Critical Habitat	*May affect, likely to adversely affect*

** Yellow-billed cuckoo and Moapa dace were not included in the USFWS official species letter but are addressed in this BA due to the proximity of the species' ranges to the Project areas.*

2 DESCRIPTION OF THE PROPOSED ACTION

This chapter provides a detailed description of the proposed Projects. It describes the various components of the Projects and includes discussions of the proposed construction process, O&M procedures, and decommissioning.

The larger Project would include 4 separate solar Projects as well as a shared facilities area and off-site components including two gen-tie options, site access roads, a temporary water pipeline, and an existing road that provides access to the gen-tie right-of-way (ROW). The solar Projects would all be located on the Reservation and would include Chuckwalla 1a (1,976 acres), Chuckwalla 1b (480 acres), Chuckwalla 2 (1,572 acres), and Chuckwalla 3 (2,307 acres). These Projects would be constructed in phases; Chuckwalla

1a, 1b, and the shared facilities area would be constructed together in one phase, and Chuckwalla 2 and 3 would be constructed in two separate phases.

Major onsite facilities include four solar fields comprised of multiple blocks totaling up to 700MW AC output, access roads, and the shared facilities area (165 acres), which includes a battery energy storage system (BESS), site fencing, communications systems infrastructure, O&M facilities, helipad, site substations, laydown areas, batch plant, and a temporary water tank/water pond that would be utilized by all four Projects.

The offsite facilities would include two above ground gen-tie lines, site access roads, a temporary water pipeline, and an existing road providing access to the gen-tie line. Two gen-tie lines would be constructed; one for the first phase of the Projects - the Chuckwalla 1a and 1b Projects and the shared facilities area, and one for the second phase - Chuckwalla 2 and 3 Projects. These options would exit the lease study area on the west side and run parallel to one another for approximately 9 miles until they reach a spot north of the Crystal Substation along the southern border of the Reservation, at which point the 1a and 1b line would continue west to the ACSP Substation and the 2 and 3 line would continue south to the Crystal Substation. Approximately 5 miles of the gen-tie lines would be constructed on Reservation land, approximately 4 miles would be constructed within the BLM-administered designated utility corridor, and approximately 0.75 miles would be constructed on BLM-administered land south of the Reservation. There are two options for constructing the gen-tie lines; Option 1 would include separate lines where the two lines are parallel to one another - one 230kV and one 500kV, with a combined ROW width of 400 feet and then split into a 150-foot ROW to the ACSP site and a 250-foot ROW to Crystal Substation, and Option 2 would include a 230kV double-circuit structure where the two lines are parallel to one another with a 150-foot ROW width for most of its length, a 230/500 step-up station would be built near the Crystal Substation and a short section of 500kV line would run from the step-up substation to deliver the power to Crystal at 500kV. These lines would require a variable ROW width depending on location and kV of the line and would range between 150 and 400 feet.

Additional offsite facilities include site access roads using existing roads that would provide access to the Projects and gen-tie lines; one of these roads would require upgrades and the others would not. Temporary facilities that would be removed at the end of construction include a temporary water pipeline, a temporary water pond or water tanks, temporary work areas, temporary trailers and parking areas, pull sites, batch plant, and laydown yards. **Table 2-1** summarizes the principle components of the Projects and the associated agency actions.

Power produced by the Projects would be conveyed to the regional transmission system via the gen-tie lines and interconnection to either the Crystal Substation or the ACSP substation where it would tie in with the Harry Allen Substation.

Table 2-1

SUMMARY OF AGENCY LANDS / JURISDICTION

PROPOSED CHUCKWALLA PROJECTS

Agency	Project Component	Location	Agency Action	Mileage / Acreage[1]
BIA	Solar Fields	Reservation	Lease	Up to 6,501 acres
	Site Access Roads	Reservation	ROW	3.3 miles / 14 acres
	Parallel 230/500 kV Gen-tie Lines[2]	Reservation	ROW	6.4 miles / 311 acres
	230 kV Line[2]	Reservation	ROW	0.7 miles / 13 acres
	Temporary Water Pipeline	Reservation	ROW	3 miles / 8 acres
	TOTAL BIA			13.4 miles / 6,847 acres
BLM	Existing Access Road	Designated Utility Corridor on Tribal Lands and managed by BLM	ROW	0.2 miles / 0.6 acres
	Existing Access Road	BLM Lands	ROW	1.1 miles / 3 acres
	Parallel 230/500 kV Gen-tie Lines[2]	Designated Utility Corridor on Tribal Lands and managed by BLM	ROW	3 miles / 143 acres
	230 kV Line[2]	Designated Utility Corridor on Tribal Lands and managed by BLM	ROW	1.4 miles / 25 acres
	500 kV Line[2]	Designated Utility Corridor on Tribal Lands and managed by BLM	ROW	0.9 miles / 29 acres
	500 kV Line[2]	BLM Lands	ROW	0.8 miles / 23 acres
	TOTAL BLM			7.4 miles / 223.6 acres

[1] Acreage and mileage are approximate. Gen-tie line acreage is based on a ROW that varies from 150 to 400 feet wide, depending on location. Only a portion of the ROWs would be disturbed. Only a portion of the solar field would be disturbed by the final footprint of the Project.

[2] Gen-tie data provided for Option 1 to show worst-case impacts

The total acreage of temporary and permanent disturbance associated with the Projects is summarized in **Table 2-2**. The solar fields and shared facilities area contain several major facilities, referred to in this document as onsite facilities. Onsite facilities would impact a portion of the approximately 6,500-acre lease study area. Onsite facilities are discussed in detail below. Gen-tie lines, site access roads, and the temporary water pipeline, referred to in this document as offsite facilities, are also discussed in detail below. The Projects would implement best management practices (BMPs) and design features to guide design, construction, O&M, and decommissioning to minimize environmental impacts. The BMPs, minimization measures, and design features incorporated into the Projects are summarized in **Appendix C** of the Draft Environmental Impact Statement (DEIS).

Permanent disturbance areas will be those areas where the surface of the ground is not restored to its existing condition after construction, such as foundations or new access roads. Temporary disturbance areas include those where construction activity will take place but where restoration of the surface will be possible, such as temporary work areas, pull sites, and laydown yards. In some places, areas of

temporary disturbance will overlap with previously disturbed areas. The Chuckwalla 1a Project is estimated to result in approximately 65 acres of permanent disturbance and approximately 1,576 acres of temporary disturbance. The Chuckwalla 1b Project is estimated to result in approximately 19 acres of permanent disturbance and approximately 351 acres of temporary disturbance. The Chuckwalla 2 Project is estimated to result in approximately 67 acres of permanent disturbance and approximately 1,084 acres of temporary disturbance. The Chuckwalla 3 Project is estimated to result in approximately 100 acres of permanent disturbance and approximately 1,648 acres of temporary disturbance. The Chuckwalla shared facilities area is estimated to result in approximately 117 acres of permanent disturbance and approximately 25 acres of temporary disturbance. Gen-tie option 1 (parallel ROWs) is estimated to result in approximately 48 acres of permanent disturbance and approximately 83 acres of temporary disturbance. Gen-tie option 2 (double-circuit line) is estimated to result in approximately 40 acres of permanent disturbance and approximately 59 acres of temporary disturbance. The site access roads are estimated to result in approximately 10 acres of permanent disturbance and no acres of temporary disturbance. The temporary water pipeline is estimated to result in no acres of permanent disturbance and approximately 10 acres of temporary disturbance. The existing road providing access to the gen-tie ROW is estimated to result in approximately 5 acres of permanent disturbance and no acres of temporary disturbance.

Table 2-2
TEMPORARY AND PERMANENT DISTURBANCE BY PROJECT COMPONENT

Project Component	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Chuckwalla 1a Solar Field[1]	1,576	65
Chuckwalla 1b Solar Field[1]	351	19
Chuckwalla 2 Solar Field[1]	1,084	67
Chuckwalla 3 Solar Field[1]	1,648	100
Chuckwalla Shared Facilities[2]	25	117
Gen-tie Option 1[4]	83	48
Gen-tie Option 2[4]	59	40
Site Access Roads	0	10
Temporary Water Pipeline	10	0
Existing Road providing access to Gen-tie ROW	0	5
Total[4]	**4,777**	**431[3]**

[1] The solar fields include all facilities within their boundaries including solar arrays, internal site roads, the BESS (if it is distributed) and all associated components.
[2] The shared facilities area includes all facilities within its boundary including the BESS (if it is centrally located), O&M area, water pond/water tanks, two site substations, and fire protection system.
[3] These acres would be graded and kept free of vegetation for the duration of operations while the remainder would not be graded with vegetation left in place.
[4] Gen-tie Option 1 was used for the total to show worst-case impacts

2.1 Onsite Facilities

The solar fields include the following onsite facilities discussed in detail below: solar blocks, site fencing, meteorological stations, and internal access roads. The BESS could be distributed throughout the solar sites or may be centrally located in the shared facilities area. **Figure 2-1** shows the Project lease areas and

offsite facilities (this figure also depicts offsite facilities including gen-tie lines and access roads which are discussed in detail in **Section 2.2**).

2.1.1 Solar Blocks

The lease study area would be split into four separate solar Projects; Chuckwalla 1a, 1b, 2, and 3. Each of these Projects would include mounted PV solar panels, inverter stations, and transformers that would be combined to form solar blocks which would be repeated to create electrical energy of up to 200 MW for Chuckwalla 1a, 50 MW for Chuckwalla 1b, 200 MW for Chuckwalla 2, and 250 MW for Chuckwalla 3. The direct current (DC) electricity from the solar arrays is collected at inverters where the DC is converted to alternating current (AC). The voltage of the electricity is increased by a transformer at each inverter. Medium voltage electric lines (underground and/or overhead) are used to collect the electricity from each transformer and transmit it to the site substation, where the voltage is further increased by a high voltage transformer to be transmitted to the electric grid. Multiple transformers would be connected in parallel via low voltage (12.5kV or 34.5kV) collector lines to the two Project substations, where the power from all four Projects would be stepped up for delivery to the grid via the gen-tie lines described below. **Figure 2-2** shows the conceptual site plan for the full Project layout.

The proposed PV solar fields would utilize crystalline silicon, bi-facial, or thin-film PV panels that would be mounted on single-axis trackers. The panels would be oriented in north-south rows with the panels moving to track the sun as it moves across the sky during the day.

PV technology converts sunlight directly into direct current (DC) electricity. The process starts with PV cells that make up the solar modules. There are several types of PV solar cells. The two major types of cells are wafer-based silicon cells and thin-film cells. Several solar cells electrically connected to each other and mounted in a single support structure or frame is called a module. Several modules can be wired together to form an array and arrays can be connected in both series and parallel electrical arrangements to produce any required voltage and current combination.

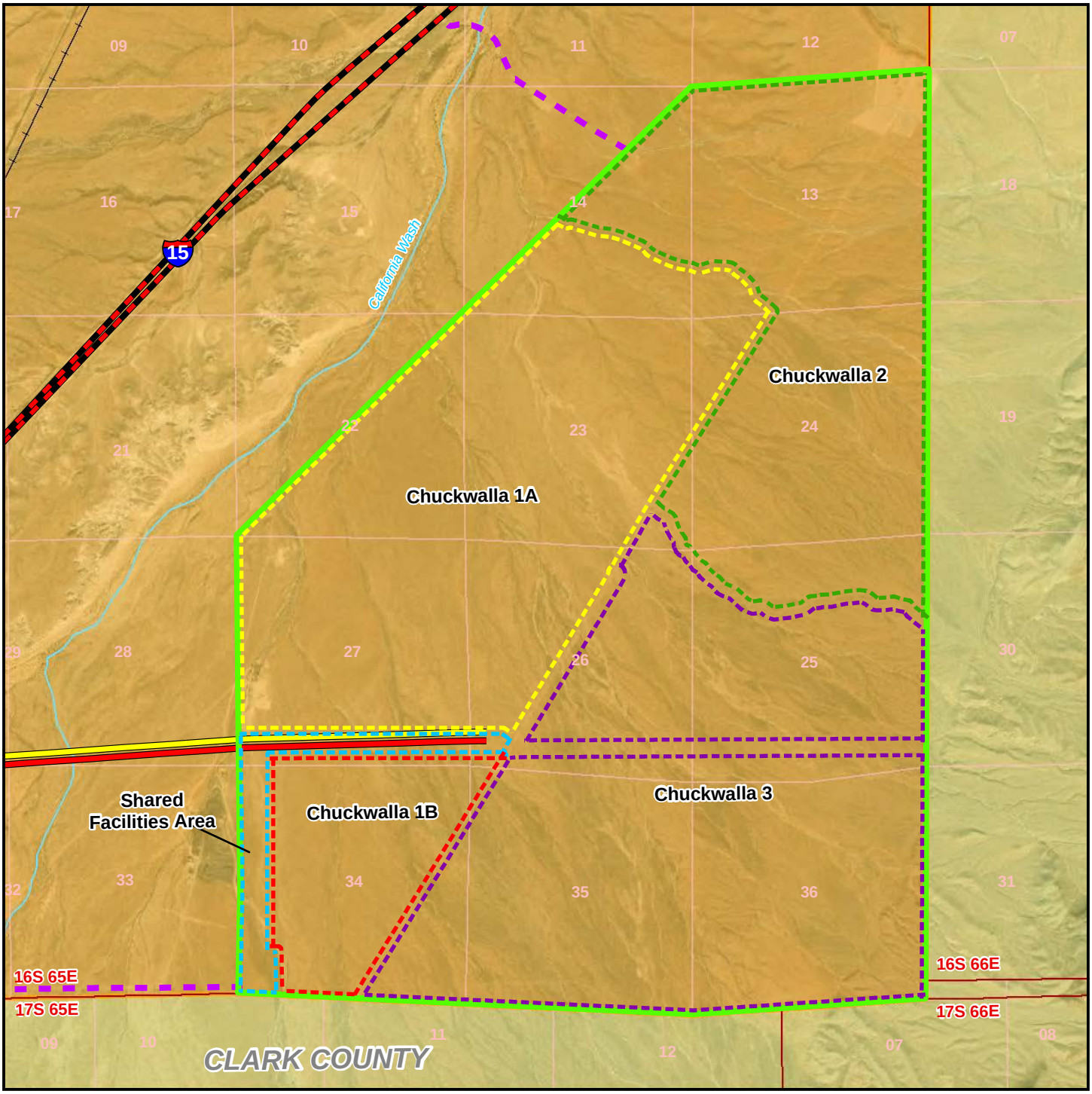
The DC from the array is collected at inverters where the DC is converted to alternating current (AC). The voltage of the electricity is increased by a transformer at each inverter. Medium voltage electric lines (underground and/or overhead) are used to collect the electricity from each transformer and transmit it to the site substation, where the voltage is further increased by a high voltage transformer to be transmitted to the electric grid. Multiple transformers would be connected in parallel via low voltage (12.5kV or 34.5kV) collector lines to two Project substations, where the power from all four projects would be stepped up for delivery to the grid via the gen-tie lines described below. **Figure 2-2** shows the conceptual site plan for the full Project layout.

The PV modules, inverters, and transformers would be grouped into array blocks of up to 4.4 MWs with each occupying approximately 23 acres. Inverter and transformer sizes would be selected based on cost and market availability prior to construction. A typical layout depicting the arrangement of a block of solar arrays for a single-axis tracker configuration is shown on **Figure 2-3**.

The highest point on the single axis-trackers would be up to 18 feet, occurring during the morning and evening hours when the panels are tilted to face the rising or setting sun. The degree of tilt would change over the course of each day for the single-axis trackers. **Figure 2-4** shows a cross-sectional view of a typical single-axis tracker. The PV units would be mounted on driven or pre-drilled H-pile foundations to support the panel mounting system. Site specific soil tests validate the preliminary engineering and if additional tests or installations conclude that further foundations are required, the vertical steel beams would be

attached to concrete ballasts. The electrical equipment (inverters and transformers) would be in enclosures or covered by shade structures approximately 8 to 10 feet high.

The Projects would also include one or more small meteorological monitoring stations to track solar insulation, temperature, wind direction, and speed. These stations would have a height of approximately 10 feet and would be located within the disturbed site.



Legend

- Chuckwalla Solar Lease Area
- Chuckwalla 1A
- Chuckwalla 1B
- Chuckwalla 2
- Chuckwalla 3
- Shared Facilities Area
- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Interstate
- Railroad
- Township
- Section
- Jurisdictional Land Ownership
- Indian Reservation
- Bureau of Land Management Land

Chuckwalla Solar Project

Figure 2-1
Solar Project Lease Areas

Map Extent: Clark County, Nevada

Date: 10-13-21		Author: rnc

G:\Chuckwalla Solar Project/MXD's/Project Location 8.5x11 101321.mxd

0 0.25 0.5
Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

- Met Tower
- Microwave Tower
- Water Well
- Tavaci Gentie
- Proposed Fence Line
- Railroads
- Collection Line Stream Crossings
- Project Roads
- Controlled-access Highway
- Solar Panel Area
- Inverters & Co-Located DIstributed BESS
- Drainage Ditch
- Battery Storage Yard
- Laydown Yards - Temporary
- O&M Large
- O&M Small
- Substation Main Site
- Substation Alternate Site
- Batch Plant Yard
- Construction Staging Area/Parking Lot
- HeliPad
- Dust Control Retention Pond - 180' x 300'
- Chuckwalla Phase 1A
- Chuckwalla Phase 1B
- Chuckwalla Phase 2
- Chuckwalla Phase 3
- Shared Use Area

Chuckwalla Phase 2
1573.6 acres
Tavaci

Chuckwalla Phase 1A
1976.1 acres
Chuckwalla

Shared Use
164.9 acres

Chuckwalla Phase 1B
478.7 acres
Tavaci

Chuckwalla Phase 3
2224.6 acres
Tavaci

Old Corkscrew Rd

S R 40

Valley of Fire Hwy

0 0.17 0.35 0.7 1.05 1.4 Miles

Source: Source | YYYY| G:\Projects\SEA_West\Tavaci\50_GIS\Tavaci.aprx | Layout: Site_Plan_Chuckwalla_BIA_20210913 | Last Updated 10/7/2021 by peter.bower

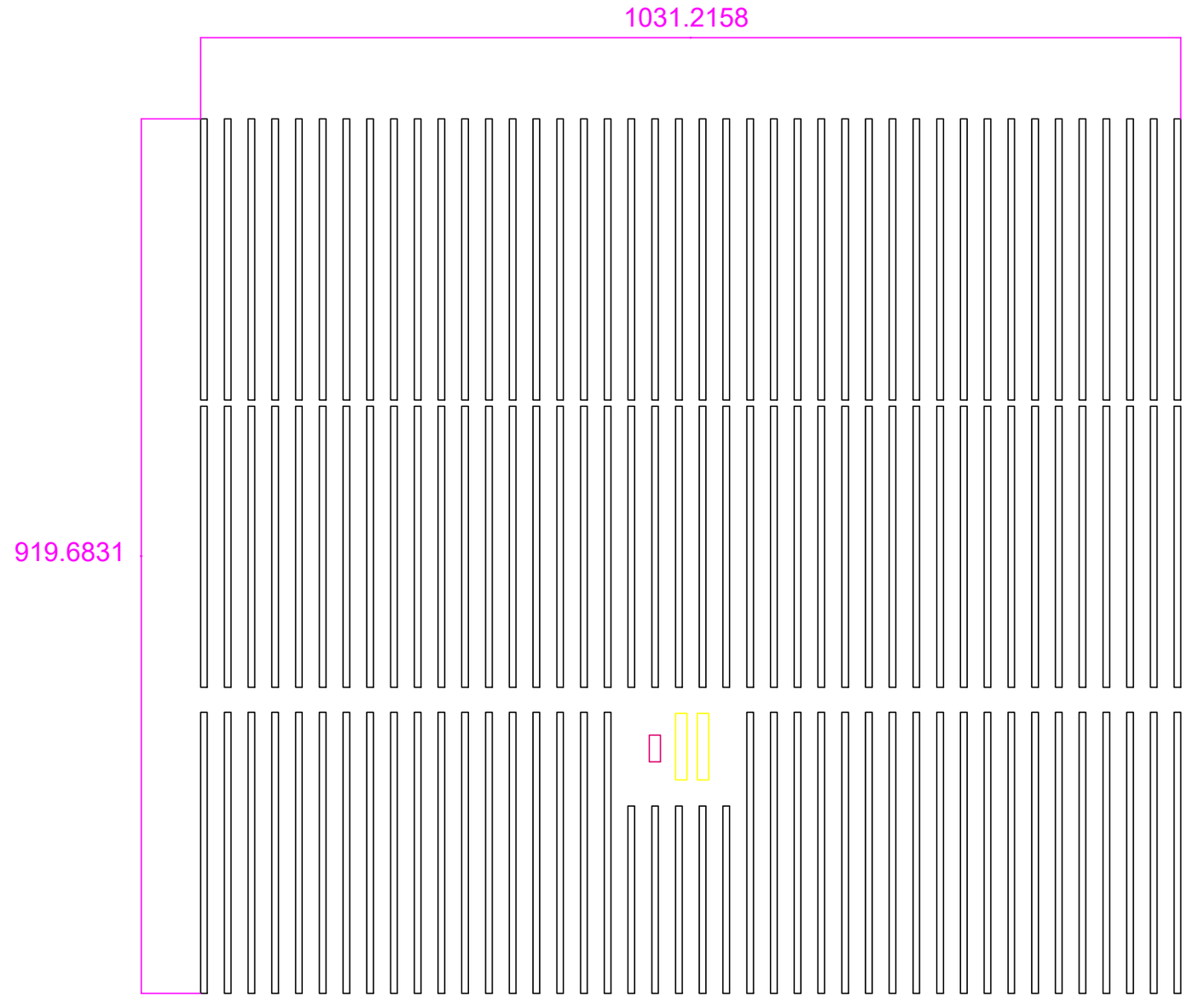
edf renewables

Figure 2-2 Site Plan

Chuckwalla Solar Project | Clark County, Nevada

SP

Conceptual



N

EDF- Renewable Energy
15445 Innovation Drive
San Diego, CA 92128

PROJECT OWNER

EDF- Renewable Energy
15445 Innovation Drive
San Diego, CA 92128

PROJECT ENGINEER

Job Name	Project Name
Date	
Designed By	
Drawn By	
Checked By	

REVISION BLOCK

Symbol	Date	By	Revisions

LEGEND

PROJECT DETAILS

Chuckwalla Solar

PROJECT NAME

Conceptual Block Design

TITLE SHEET

1. Conceptual design. Actual design to be provided by contractor.
2. Drawings are preliminary and draft unless otherwise stated. Variations in system design can occur.
3. Designs, Layouts, Locations and any other information found in this or any linked set of drawings are property of EDF Renewable Energy Corp.
   Use of the drawings or any part of these drawings requires prior consent from EDF Renewable Energy Corp.
4. This drawing is for permitting purposes only. Not for Construction.

NOTES

v.1

SHEET NO.

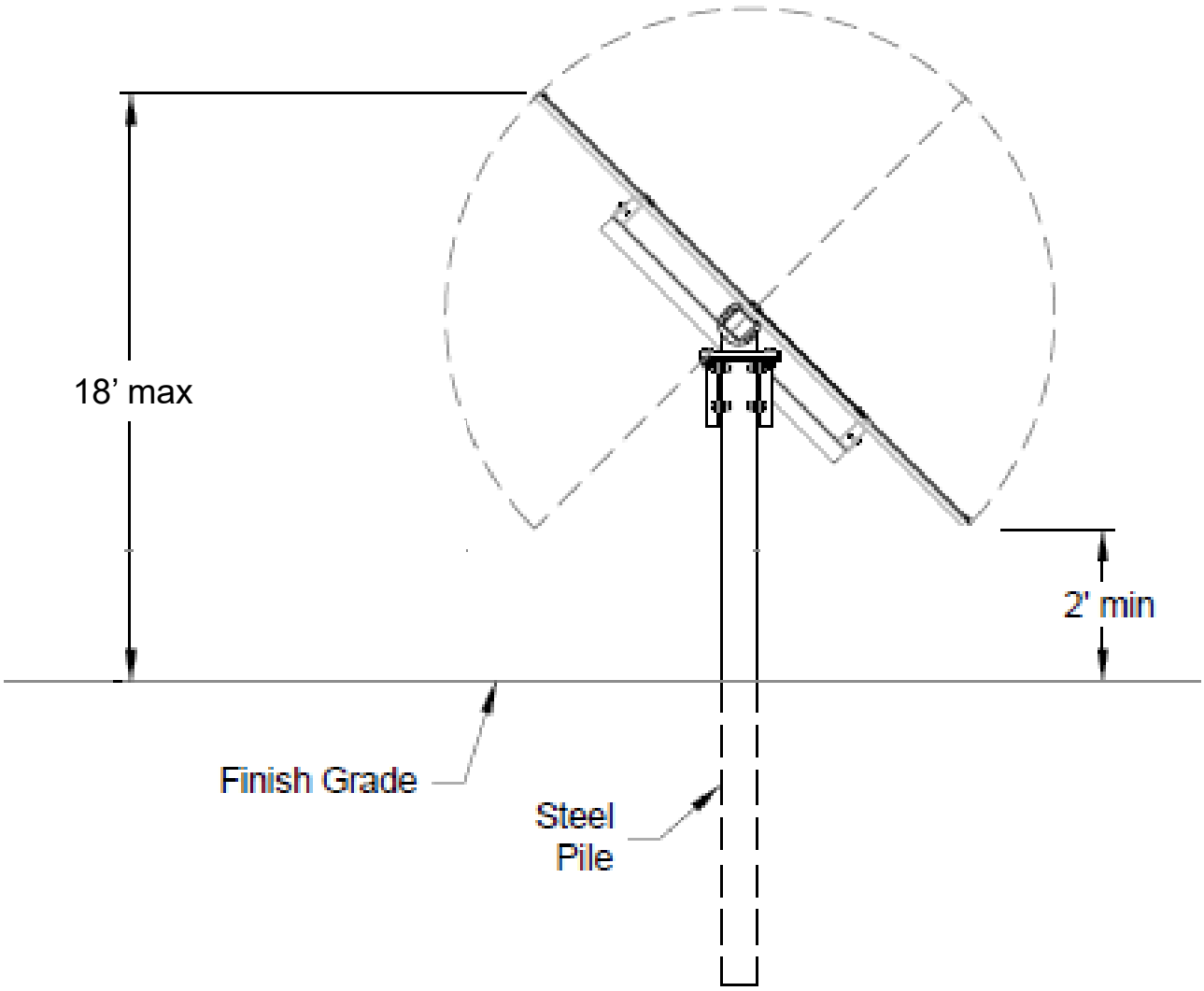


Figure 2-4

Typical Tracker PV Mounting System

2.1.1 Battery Energy Storage System

The most likely BESS technology would be either lithium-ion (Li-ion) or redox flow battery. The BESS could be integrated into each Project in two primary configurations - the BESS facilities would be distributed throughout each solar field at each array or the BESS facilities would be centrally located. Most of the BESS would be installed during construction. The remainder would be added to the Project site later during the Project life as needed to increase the BESS capacity as the system capacity degrades over time. This would be done as part of regular O&M activities.

Each BESS container would have its own fire detection system. In the case of BESS located in buildings, the building would comply with the local fire code and contain equipment at multiple sections of the building for fire detection, suppression, and necessary alarms to alert the local fire authorities. The BESS containers or building would also be located such that it is readily accessible by the fire department.

2.1.1.1 Distributed BESS

In this configuration, Li-ion batteries would be in BESS containers that would be distributed throughout the Project site with each solar array block having up to two BESS containers placed adjacent to the solar inverters and the converters. Containers would be up to 13 feet tall, 70 feet long, and 12 feet wide. The total area on the solar sites attributed to the BESS facilities would be up to approximately 45 acres – about 13 acres for Chuckwalla 1a, about 4 acres for Chuckwalla 1b, about 13 acres for Chuckwalla 2, and about 15 acres for Chuckwalla 3.

The BESS containers could be made of steel or concrete. In addition to the battery modules, the containers would also contain a fire detection system; alarms and monitoring system; heating, ventilation and air conditioning (HVAC) system; data collection and control system; and other electrical wiring and auxiliary systems.

2.1.1.2 Centrally Located BESS

In this configuration, all the BESS facilities would be located at one location within the shared facilities area and the system would use either Li-ion or redox flow technology.

If Li-ion batteries are used, they would be in BESS containers (up to 13 feet tall, 70 feet long, and 12 feet wide) or in a warehouse-type building and would include the same support facilities described above. The total land disturbance within the shared facilities area attributed to the BESS facilities for all four projects under this scenario would be 45 acres at this one location.

If redox flow technology is used, all battery equipment would be placed in one warehouse-type building or the batteries would be placed in multiple containers within the shared facilities area. Redox flow battery modules are batteries that contain a reversible cell in which electrochemical components are dissolved in electrolyte fluids separated by a membrane. In addition to the battery modules, the building or containers would also have storage tanks for redox flow battery electrolytes, spill containment, plumbing, fire detection system, alarms and monitoring system, HVAC units, data collection and control system, and other electrical wiring and auxiliary systems. The building would be similar to the O&M building described below and the BESS inverter pads or transformers would be located outside and adjacent to the building. The electrolyte storage tanks could also be located outside the building rather than being inside depending on the system design. The total disturbance for this BESS configuration for all four projects would be 95 acres at the shared facilities area.

2.1.2 Operation and Maintenance Area

An O&M building would be developed on the site within the shared facilities area that would be used by all four projects and would contain administrative offices, parts storage, a maintenance shop, plant security systems, and plant monitoring equipment with adjacent worker parking. The O&M building would likely consist of one single story building of approximately 6,000 square feet with a maximum height of approximately 25 feet. The building would have exterior lighting on motion sensors, fire and security alarms, and would comply with all applicable laws and regulations (including applicable Operational Safety and Health Act [OSHA] requirements).

In the shared facilities area, a helipad would be developed to provide first-responder access for Clark County Emergency Services. The dimensions of the helipad would be about 100 feet by 100 feet and the area would be compacted and covered with gravel and would provide sufficient clearance from all structures and any potential obstructions.

2.1.3 Water Use

During construction, each phase of the Chuckwalla projects (1a and 1b together, 2, and 3) would use between 100 and 300 acre-feet per year (AFY) of water, primarily for dust control. Operations of each phase would require up to 30 AFY of water for a total of 90 AFY. Operational water would be used for panel washing, potable and sanitary uses, and other operational uses, such as dust control.

Water would be provided to the Project by the Moapa Band from either an existing groundwater well located on the Reservation or a new well developed on the solar site. The existing well is the Moapa Band's well at the Moapa Paiute Travel Plaza in Section 31, T16S, R65E. During construction, if water is provided from the Moapa Band's off-site well, it would be delivered via a temporary water pipeline or trucked to the site. Construction water would be stored on site in temporary holding ponds or covered above-ground water tanks that would be located within the shared facilities area. Potable water would be provided via bottled water during construction.

If a new well(s) is developed on site, it would be located within the shared facilities area. In addition to construction water, it could provide water for personnel and panel washing during operations. If a new well is not developed on site, water for panel washing would be trucked to the site when needed and bottled drinking water would be provided for potable water during operations.

2.1.4 Wastewater Management

If a new well(s) is developed on-site, the Project could generate wastewater during operations from bathroom and shower facilities located within the O&M building. This wastewater would be treated and disposed at the site using a septic disposal system consisting of septic tanks and a leach field. If a new well is not developed on site, portable toilets would be used during operation.

2.1.5 Project Support Systems

The following Project support systems would be developed for the Projects.

2.1.5.1 Site Substations

Two substations would be built on the solar site to facilitate interconnecting the Projects. One would accommodate the 230kV gen-tie connecting Chuckwalla 1a and 1b. The other would accommodate the 230kV or 500kV gen-tie connecting Chuckwalla 2 and 3. The two substations would be located adjacent to one another within the shared facilities area on the site.

The Chuckwalla 1a and 1b site substation would include medium voltage (34.5kV) to high voltage (230kV) step-up transformer(s) with mineral oil, breakers, buswork, protective relaying, supervisory control and data acquisition (SCADA), and associated substation equipment. The site substation serving both Chuckwalla 2 and 3 would include the same equipment except that the step-up transformer could be 34.5/500kV if the gen-tie line were to be built at 500kV. If the Chuckwalla 2 and 3 gen-tie is built at 230kV, an additional 230/500kV step-up station would be built near the existing Crystal Substation from which a short 500kV line would provide the interconnection to Crystal at 500kV. This is described in more detail in **Section 2.2** below and shown on **Figure 1-2**.

The relative location of the site substations is shown on the site layout plan for the Project (**Figure 2-2**). Each substation would be fenced for safety in accordance with applicable codes and one or more structures may be outside the fence for meters and control equipment. The communication system for the substation may include above-ground fiber optic cable and/or a microwave tower mounted on the control building or on a lattice tower up to 100 feet tall. If a fiber optic line is used, it would be mounted on the gen-tie line structures as one of the shield-wires. The two gen-tie lines are described below.

2.1.5.2 Site Fencing

The perimeter of each solar field area would be secured with a minimum 6-foot tall, chain link metal-fabric security fencing with up to 2-foot barbed wire or razor wire on top. Controlled access gates would be located at the site entrance to each area. Temporary desert tortoise exclusion fencing would be installed and kept in place during construction. The permanent perimeter fence would be installed to leave a 6 to 8-inch opening at the bottom of the fence to allow for the movement of desert tortoises and other wildlife across and through the site once the construction of the facility is complete. The substation fence discussed above would not allow for wildlife movement.

2.1.5.3 Internal Site Roads

Within the solar fields, internal site roads would be built between the solar blocks to provide vehicle access to the solar equipment (e.g., solar panels, inverter stations, transformers). The existing soil surface of all internal site roads would be bladed with a road grader and roads to inverter stations would also be compacted and graveled with onsite materials. These internal site roads would occupy approximately 157 acres for all four sites. Turnarounds would be constructed where needed at the terminus of the roads to facilitate vehicle and equipment turn-around. The existing soil surface of all access roads would be leveled with a road grader. In addition to grading, access roads that lead to inverter stations would be compacted and graveled with onsite materials.

2.1.5.4 Fire Protection System

A shared fire protection water system would be supplied from up to three above-ground raw water storage tanks located on the site holding up to 12,000 gallons each. Fire protection pump flowrates would be in accordance with applicable standards. All fire protection system pumps must be shut off manually.

The piping network would be configured in a loop so that a piping failure can be isolated with shutoff valves without interrupting the supply of water to a majority of the loop. Portable fire extinguishers of appropriate sizes and types would be located throughout the Project sites.

In addition, each BESS container would have its own fire detection system. Whether the BESS is located in containers or buildings, the structures would comply with the local and federal fire code and contain equipment at multiple sections of the building for fire detection and necessary alarms to alert the local

fire authorities. The BESS containers or building would also be located such that it is readily accessible by the fire department.

A Fire Prevention Plan would be prepared prior to construction that would cover the construction, operation, and decommissioning of the facility. The plan would include measures to safeguard human life, prevent personnel injury, preserve property, and minimize downtime due to fire or explosion. Fire protection measures would include prevention methods using fire-safe construction, reduction of ignition sources, control of fuel sources, availability of water, and proper maintenance of fire-fighting systems. The plan would be coordinated with the BIA, Moapa Band, BLM, and Clark County.

2.1.5.5 Security

As mentioned above, each solar field would be fenced with a chain-link security fence open at the bottom to facilitate desert tortoise and other wildlife movement. Lights, triggered by motion sensors and powered by station power with backup battery power, would also be installed at each entry gate.

Perimeter signage at the substation, in both English and Spanish, would also be provided and installed at intervals along the perimeter fence stating the following: “Danger, Keep Out!”, and “Hazardous Voltage Inside”.

2.1.5.6 Lighting

The Projects’ lighting system would provide operation and maintenance personnel with illumination for both normal and emergency conditions near each main entrance, the Project substations, and at the BESS facilities. Lighting would be designed to provide the minimum illumination needed to achieve safety and security objectives and would be downward facing and shielded to focus illumination on the desired areas only. There would be no lighting in the solar field except for emergency lighting at the BESS facilities. Therefore, light trespass on surrounding properties would be minimal. If lighting at individual solar panels or other equipment is needed for night maintenance, portable lighting would be used.

2.1.5.7 Erosion Control and Stormwater Drainage

The primary drainages flowing through the sites would be avoided by the solar fields. Stormwater flows from upstream of the sites would flow through the sites via these ephemeral drainages with the overall drainage patterns maintained. Most of these drainages would be left in their natural condition but improvements would be incorporated as needed to direct and maintain flow within the primary drainage paths and away from the solar arrays. It is expected that pre-construction stormwater flows and velocities traversing the sites would be generally unchanged. Detention basins or other design features could also be incorporated into the final solar field design to manage flows.

Most of the sites would continue to be drained by sheet flow to on- and off-site drainages. Areas of the facility that have the potential for release of contaminants due to vehicles and human activities, such as the O&M building, substations, BESS facilities, delivery areas, and paved roads would be addressed through source control best management practices (BMPs) and designed to accommodate runoff from the 100-year storm event at a minimum.

On-site erosion would be controlled through the implementation of BMPs detailed in erosion and sediment control plans developed by the contractor for the construction and operational phases of the Projects.

2.1.5.8 Spill Prevention / Containment

Local area containments would be provided around certain locations, such as oil-filled transformers and chemical storage areas and BESS facilities, to prevent water that could come in contact with oil or chemicals from leaving the site. A spill prevention control and countermeasure plan (SPCC) would be prepared to meet the applicable regulatory requirements.

2.2 Off-site ROWs

As discussed previously, the primary off-site ancillary facilities needed to support the Chuckwalla Projects include two gen-tie lines, two access roads, and a temporary water pipeline. The locations of these facilities are shown on **Figure 1-2.**

2.2.1 Gen-tie Transmission Lines

The proposed gen-tie lines would deliver the power generated by the currently proposed Project to the electrical grid. Two gen-tie routes would be developed to interconnect the Projects. A 230kV line would interconnect the Chuckwalla 1a and 1b Projects to the Harry Allen Substation. A 230 kV or 500kV gen-tie line would interconnect the Chuckwalla 2 and 3 Projects to the Crystal Substation.

The gen-tie line interconnecting Chuckwalla 1a and 1b would be approximately 10 miles of single-circuit 230-kV overhead transmission. From the Projects, its route would go west across tribal lands for about 2.5 miles where it would cross I-15. On the west side of I-15, it would continue in a northwesterly direction for approximately 2.9 miles where it would enter the designated utility corridor on the Reservation that is managed by the BLM. Inside the corridor, the line would go southwest and south for another approximately 3.1 miles where it would turn west for about 1.2 miles then exit the corridor and continue on tribal land into the ACSP site for about 0.7 miles to the location of the planned ACSP site substation. Thereafter, it would connect with the approved MSEC Project gen-tie line to the Harry Allen Substation, located on BLM-managed federal land south of the Reservation.

The 230kV or 500kV line interconnecting Chuckwalla 2 and 3 would utilize the same route as the Chuckwalla 1a and 1b 230-kV gen-tie for about 8.5 to 8.9 miles to a point within the designated utility corridor north of the Crystal Substation. From that point, the Chuckwalla 2 and 3 gen-tie line would extend south within the designated utility corridor where it would leave the Reservation and continue about 0.7 miles on federal land managed by the BLM to the Crystal Substation. If the line from the solar project is built at 230kV, a small 230/500 step-up substation would be built near the Crystal Substation to deliver the power at 500kV to Crystal.

Chuckwalla 2 and Chuckwalla 3 are currently requesting interconnection at Crystal and the interconnection queue positions are identified as NC5-005 (200MW) and NC5-007 (250MW). NC5-005 will require improvement within Crystal Substation such as installation of breakers, metering, protection equipment, communication and protection systems, and re-termination of transformers. The improvements/upgrades required for NC5-007 still need to be determined.

Two options for constructing these gen-tie lines could be used:

Option 1: Where the lines are parallel to one another, they could be built as separate lines - one 230kV and one 500kV, with a combined ROW width of 400 feet and then split into a 150-foot ROW to the ACSP site and a 250-foot ROW to Crystal; or

Option 2: Where the lines are parallel to one another, both lines could be built at 230kV on a double-circuit 230kV structure with a 150-foot ROW width for most of its length, a 230/500 step-up station would be built near the Crystal Substation and a short section of 500kV line would run from the step-up substation to deliver the power to Crystal at 500kV.

Table 2-2 shows the temporary and permanent disturbance that would result from each of these options.

The Project would use H-frame or single steel pole structures that would be made of self–weathering or galvanized steel. The steel monopole transmission structures would be used for the 230kV gen-tie lines and H-frame structures for the 500kV line. The structures would range in height from 120 feet to 170 feet.

The design, construction, operation, and maintenance of the transmission lines would meet requirements of the National Electrical Safety Code (NESC); U.S. Department of Labor, Occupational Safety and Health Standards; and the Resource Management Plan's requirements for safety and protection of landowners and their property. Transmission line design would also be consistent with recommendations for reducing negative impacts of power lines on birds found in Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006 by Edison Electric Institute and the Avian Power Line Interaction Committee (APLIC 2006) and Reducing Avian Collisions with Power Lines by the U.S. Fish and Wildlife Service and the APLIC (APLIC 2012).

2.2.2 Site Access Roads

The Project solar sites will require vehicular access for construction, operation, maintenance, and decommissioning. To provide the needed access, an existing 2.25-mile road on the Reservation along its southern boundary between the Valley of Fire Highway and the site would be upgraded. Another existing road on the Reservation approximately 1.0 mile long would provide access from I-15 to the northern portion of the lease study area.

The site access roads would be designed to accommodate equipment deliveries, the construction workforce, and ultimately, the operational needs of the Projects. The roadway section would have two travel lanes, would be approximately 24-foot wide with 5-foot shoulders, and have drainage swales on either side. Final design for the access road would be consistent with BIA and tribal road standards and the road would be maintained by the Project.

The current width and potential need for upgrades for these site access roads are described in **Section 2.3** on construction.

2.2.3 Water Pipeline

Water for construction of the Projects would be provided by the Moapa Band either from an off-site existing well or from a new on-site well. During construction, if water is provided from the off-site well, it would be delivered to the Projects via a temporary water pipeline or by water trucks and would be stored on site as needed. If delivered via a water pipeline, the pipeline would originate at the Moapa Paiute Travel Plaza well in Section 31, T16S, R65E and would be routed to follow the proposed gen-tie route to the site. The route would be approximately 3 miles long and located wholly on the Reservation.

The water pipeline would follow existing roads and the gen-tie ROWs from the source to temporary pond or holding tanks the solar Projects shared facilities area. The pipeline would be 8 to 12 inches in diameter and, because it would be temporary, it would be placed on the ground surface to facilitate removal

following construction. At periodic intervals, it could be elevated on blocks to allow the passage of desert tortoise and other small animals.

2.3 Project Construction

2.3.1 Solar Field Construction

2.3.1.1 Grading / Site Preparation

Prior to the initiation of construction, the Project sites would be surveyed and staked. Preconstruction survey work would consist of locating the site and ROW boundaries, the locations of proposed facilities, and the centerlines of linear features. Clearance surveys will be conducted by authorized desert tortoise biologists prior to construction to translocate any desert tortoise on site. These surveys would be initiated following installation of the temporary tortoise exclusion fencing. Prior to the initiation of any preconstruction surveys, the necessary permits for rights-of-entry would be obtained.

Vegetation would be permanently cleared via grading from roadways, site access ways, and at inverter equipment within the solar field and substations, BESS locations, and O&M facilities within the shared facilities area. These acreages of grading / permanent disturbance are identified in **Table 2-2** for each of the Projects.. Within the solar field, native vegetation would be left in place to the extent possible with some mowing and selective trimming as needed to create a safe work environment and avoid interference with the movement of the solar panels. Prior to construction, vegetation within the solar arrays would be mowed to a height of 18 inches leaving the roots intact to facilitate regrowth during operations. Construction equipment would drive over and crush the vegetation during installation of the arrays.

The cuts and fills associated with all earthwork required on the site are planned to be balanced on-site to the extent practicable. Within the solar fields, some grading would be required for the Project substation, O&M area, BESS area(s), perimeter roads around the solar arrays, electrical equipment pads and where the panel support foundations are driven or drilled. A small graded pad could be required within each solar array to accommodate the inverter and transformer or they could be installed on driven piers.

Excavation would be required for trenches for electrically connecting some of the equipment on site. Following construction, all underground trenches would be filled with native soils and/or imported fill and compacted.

2.3.1.2 Construction Workforce

The projected construction work force includes all personnel required to complete construction of the Project including overall Project and site management, laborers, skilled craft, and startup personnel. Skilled craft and laborers would be drawn from the local area with construction management and startup functions provided by relocated personnel from the engineering, procurement, and construction (EPC) contracting firm and Applicant.

The Chuckwalla 1a and 1b, Chuckwalla 2, and Chuckwalla 3 Projects are each expected to create a peak of up to 450 and an average of 350 temporary construction jobs for the construction period.

2.3.1.3 Construction Sequencing

Construction of the solar fields for Chuckwalla 1a and 1b would be built at the same time and would take up to 20 months. Likewise, construction of Chuckwalla 2 and 3 would each also take up to 20 months. It is expected that each phase would be constructed over different, non-overlapping 20-month time frames.

These schedules would be designed to meet the commercial operations date (COD) for delivery of the energy from each Project as required by each Project's PPA.

Construction would generally occur between 5 a.m. and 5 p.m., Monday through Friday, but could occur seven days a week. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities. For instance, during hot weather, it may be necessary to start work earlier (as early as 3:00 am) to avoid work during high ambient temperatures. Also, construction requirements would require some nighttime activity for installation, service or electrical connection, or inspection and testing activities. Nighttime activities would be performed with temporary lighting.

The construction phases for each solar field are expected to be as follows:

- **Access Road**—The main access roads to the solar Projects would be upgraded where needed.

- **Fencing**–Temporary desert tortoise exclusion fencing would be installed around each solar field and kept in place during construction. Permanent fencing could be installed simultaneously with the temporary desert tortoise fence or later as a part of overall site development.

- **Clearing**—Vegetation removal for installation of the solar facilities would be completed only as necessary to advance ahead of equipment installation but conducted to minimize the amount of disturbed ground surface at any one time.

- **Parking and Laydown**—Parking areas for construction workers and laydown areas for construction materials would be prepared inside the Project areas. Detailed information regarding the location of the laydown and parking areas within each Project would be developed after a contractor is hired to construct the facility.

- **Temporary Construction Water Pond** – A temporary water pond or water tanks would be developed within the shared facilities area.

- **Site Roads**—The internal site roads would be constructed and maintained.

- **Site Grading / Mowing**—Because of the relatively flat topography at the site, minimal volumes of soil would be moved for grading. Areas not requiring grading would be mowed where needed to facilitate movement of construction equipment.

- **Foundation Construction** – Foundations for the substation, inverters and/or BESS containers (if necessary) would be constructed and may require some earthen fill.

- **Array Installation**–The solar arrays are installed first by driving piles (including pre-drilling if required by site soil conditions). The tracker is then attached to the piles and then the PV modules (panels) are attached to the tracker. Generally, at the same time the substation equipment, inverters, and BESS are installed. This also includes running cables between all equipment. Cables between the PV panels and inverter are commonly routed through hangers or trays. Cables from the inverters to the substation would be underground (installed by trenching, laying the cable, and backfilling).

- **Shared Facilities Area**- While the arrays are being built, the shared facilities area would be constructed and would include laydown areas, a batch plant, O&M facilities, site substations, water pond/tanks, and possibly a water well(s) and BESS.

- **Balance of Plant (BOP)–**With the major equipment in place, the remaining work would be electrical and smaller component installations.

- **Testing and Commissioning**–Testing of subsystems would be conducted as they are completed. Modules would be tested once all supporting subsystems are installed and tested.

- **Site Stabilization**—Disturbed areas would be stabilized during construction to minimize wind and water erosion and fugitive dust by watering and/or use of dust palliatives approved by the USFWS. Cleared and graded surfaces that would not be subject to future disturbance would be restored. Revegetation would be conducted as soon as practicable, based on seasonal weather conditions, to maximize revegetation success.

- **Demobilization**—Any temporary fabrication and construction facilities would be removed from the site once construction is complete.

The project construction contractor would mobilize and develop temporary construction facilities and laydown areas within each Project site. Once a final design has been established, the contractor would prepare site maps showing the construction project in detail. Temporary construction facilities would include:

- Full-length trailer offices or equivalent

- Generators

- Portable toilets

- Parking for construction vehicles

- Tool sheds/containers

- Parking construction equipment

- Construction material laydown area

- Solar field equipment laydown area

- Batch plant (if needed, may be located within one of the temporary laydown areas)

Construction materials such as concrete, pipe, wire and cable, fuels, reinforcing steel, and small tools and consumables would be delivered to the site by truck. Initial grading work would include the use of excavators, graders, dump trucks, and end loaders, in addition to support pickups, water trucks, and cranes.

2.3.1.4 Site Access and Traffic

All equipment, permanent materials, and commodities for the Projects would be transported to the site via rail and/or local highways. Any shipments by railroad would go to the nearest active railroad spur for offloading and transported by truck to the Project sites. All equipment and material deliveries would utilize the identified site access routes.

Truck deliveries of equipment and materials would occur from the initial construction notice to proceed through the entire duration of each of the Projects. Initial truck deliveries would include haul trucks for importing construction equipment, as required, followed by concrete trucks for installation of major foundations. Array materials for the PV array (piles, cables and tracker assembly) would be delivered to the Project site early in the construction period corresponding to approximately the time frame for foundation array installation. Deliveries of larger equipment such as inverters, BESS equipment, and substation components would commence at about midpoint of the construction period. The batteries for the BESS facilities would be delivered last as they require back feed power prior to installation.

On-site roads would be left surfaced with the native soil and treated with water and/or a dust palliative approved by USFWS as needed.

Traffic generated during construction of each phase of the Projects would be from the delivery of equipment and supplies described above and the commuting of the construction workforce over the up to 20-month construction period. The number of workers expected on the site during construction of the Project would vary over the construction period and is expected to average up to approximately 350 with a peak of 450 workers each day, generating an average of about 600 up to a peak of 800 daily trips, as carpooling is commonplace. Also, up to 100 trips per day (50 trips to the site and 50 trips leaving the site) would occur as a result of delivery of construction equipment, materials, with an additional 40 trips per day if/when water is trucked to the site for dust control purposes. Combined, these would result in an average increase of at least 700 vehicle trips (or 350 roundtrips) per day during construction. All Project related parking would be onsite during construction.

2.3.2 Gen-tie Construction

2.3.2.1 Lay-down Yards

Construction of the gen-tie lines would begin with the establishment of lay-down yards, which would be required for storing materials, construction equipment, vehicles and in some cases as a show-up yard for the construction crews. The gen-tie lines would likely have two lay-down yards – one at each end of the lines. These areas could each require approximately 5 to 10 acres and they would be located on tribal lands.

Vegetation would be cleared with possibly grading in these areas as needed. Unless otherwise directed, the lay-down yard would be restored following construction.

2.3.2.2 Access to and Along the Gen-tie ROW (Permanent and Temporary)

For either gen-tie option, a new gen-tie road would be developed within the proposed gen-tie ROW for its entire length on both tribal and BLM-administered land. Access to each new structure location for the proposed 230kV line would be provided by these new gen-tie roads. Where the two gen-tie lines parallel each other in Option 1, access to the structures on the 500kV line would be provided by short spur roads from the new gen-tie road. New roads and spur roads would be up to approximately 20 feet wide and total approximately 13.3 miles in length. Roads would be constructed sufficiently to provide the access

needed by equipment during construction and in accordance with tribal, BIA, BLM, and other relevant standards.

To access the gen-tie ROW on the west side of I-15, construction vehicles would approximately 1.3 miles of an existing well-maintained road east of the existing Crystal Substation and no upgrades are expected to be required. The portion of this existing access road that would be used to access the gen-tie ROW is located outside the proposed ROW. On the tribal lands on the east side of I-15, the gen-tie ROW would be accessed by the access road to the site substation.

If affected, fences and gates may be built or replaced as required. If cattleguards, fences, and gates are damaged, they would be repaired or replaced to their original condition as required. Temporary gates would be installed only with the permission of the land manager or landowner.

After Project construction, existing and new permanent access roads would be used by maintenance crews and vehicles for inspection and maintenance activities.

2.3.2.3 Structure Site Clearing, Foundation Excavation, and Foundation Installation

Structure sites would be located 1,000 to 1,600 feet apart. Where the line parallels the existing lines, the new structures would be located adjacent to the existing structure where possible to best utilize the terrain and existing access. Where the line deviates from the existing lines, structure locations would be determined by topography and best engineering practices.

Vegetation clearing and ground disturbance would be required at each structure site for excavation of holes and pouring of concrete foundations. Each structure location would be cleared of vegetation, used for construction, and remain available for future line maintenance. Structure sites will only be graded if necessary. Each structure site would be approximately 125 feet by 60 feet in size resulting in approximately 0.17 acre of temporary disturbance per structure site. These sites would be smaller where needed if limited workspace is available.

Foundation excavations would be made using mechanized equipment, with tubular steel structures for a 230kV line requiring holes 6 to 12 feet in diameter. If a separate 500kV line is built using H-frame structures, each structure would require two holes 6 to 8 feet in diameter. Turning structures would generally be tubular steel structures requiring either one, two or three holes 6 to 12 feet in diameter. Structure foundation excavations would be made with power drilling equipment. A vehicle-mounted power auger or backhoe would be used to excavate the structure foundations. In rocky areas, the foundation holes would be excavated by drilling. Although not expected, in some instances blasting could be necessary because of the specific geologic conditions. Further details on blasting procedures and safeguards would be included in a Blasting Plan that would be provided prior to construction if needed. Foundation holes left open or unguarded would be covered to protect the public and wildlife. Additionally, any holes left open would be cleared by a monitor to ensure any trapped wildlife are removed before work resumes.

Foundations would be installed by placing reinforced steel and transmission structure steel components into each foundation hole, positioning the steel components, and encasing them in concrete. Excess spoil material would be used for fill where suitable and any remaining soil would be spread on the access road.

Water would be used for soil compaction and dust abatement at each structure site and along access roads, as needed. Water for footer construction and dust abatement would be obtained from the Moapa Band or other local water sources and trucked to the construction area.

2.3.2.4 Structure Assembly and Erection

Structural steel components and associated hardware would be transported from the lay-down yards to each structure site by truck. Steel structure sections would be delivered to structure locations where they would be fastened together to form a complete structure and hoisted into place by a large crane. At each structure site, a work area of approximately 125 feet by 60 feet would be required for the structure foundation locations, structure assembly, and the necessary crane maneuvers. The work area would be cleared of vegetation only to the extent necessary. Concrete for use in constructing foundations would be dispensed from concrete mixer trucks. After line construction, all pads not needed for future maintenance would be restored to the greatest extent possible and revegetated where required.

2.3.2.5 Conductor Installation

After the structures are erected, insulators, hardware, and stringing sheaves would be delivered to each structure site. The structures would be rigged with insulator strings and stringing sheaves at each ground wire and conductor position.

For public protection during wire installation, guard structures could be erected where the line would cross I-15, existing power lines, and other obstacles. Guard structures would consist of H-framed wood poles placed on either side of an obstacle. These structures would prevent ground wire, conductor, and equipment from falling on an obstacle, and would be removed following the completion of conductor installation in that area. Equipment for erecting guard structures would include augers, line trucks, pole trailers, and small cranes. Guard structures may not be required for small roads or other areas where suitable safety measures such as barriers, flagmen, or other traffic controls could be used.

Pilot lines would be pulled (strung) from structure to structure either using helicopters or pulling equipment on the ground and threaded through the stringing sheaves at each structure. Following pilot lines, stronger line with a greater diameter would be attached to conductors to pull them onto structures. This process would be repeated until the ground wire or conductor is pulled through all sheaves.

The shield wire (and/or optical ground wire [OPGW]) and conductors would be strung using powered pulling equipment at one end and powered braking or equipment tensioning at the other end of each conductor stringing segment. Sites for tensioning equipment and pulling equipment would be approximately 14,500 feet apart. Each pulling / tensioning site would temporarily disturb approximately 100 feet by 400 feet. There would be no blading at pull sites if the terrain is sufficiently level. Pull site locations will be confirmed during final design.

The number of pull sites would be different for Option 1 and Option 2. Under Option 1, approximately 39 pull sites would be needed (18 on the Reservation, 17 within the utility corridor managed by BLM, and 4 on federal land managed by BLM). Under Option 2, approximately 21 pull sites would be needed (7 on the Reservation, 10 within the utility corridor managed by BLM, and 4 on federal land managed by BLM).

2.3.2.6 Helicopter Use

As stated above, helicopters could possibly be used to pull in pilot lines. If helicopters are determined to be necessary, it is anticipated that one of the lay-down yards on the solar site would be used for helicopter

staging if needed. More details regarding helicopter use would be included in a Helicopter Flight and Safety Plan developed prior to construction. The construction contractor would also develop a detailed helicopter plan specifically for each area where they would be proposed for use.

2.3.2.7 Geotechnical Testing

Geotechnical investigations would be needed to determine the site soil conditions and to provide geotechnical engineering data for the foundation design of the proposed gen-tie lines. Prior to final design of the lines, geotechnical testing would begin with a field survey staking each test location. This would be done from a standard light-duty pickup truck and a one or two-person survey crew. Test locations would be marked with wooden stakes and flagged. Once marked, a drilling crew would collect samples via a truck-mounted drill rig at various depths along the boring. Samples collected from the borings would be analyzed to determine soil classification, moisture content, density, depth to groundwater and other characteristics. Each boring would be approximately 6 inches in diameter and up to 50 feet deep.

Work areas surrounding each geotechnical boring location that would be needed for construction equipment, vehicles, and personnel during geotechnical activities would be confined to a 30 by 40-foot area. After each test boring is completed, the spoils would be hand- backfilled into the boring hole and lightly compacted. After backfill, the test location would be smoothed and hand-graded as necessary to return the area to the pre-test grade.

2.3.3 Solar Site Access Road Construction

The proposed access to the solar sites would include two existing roads - one along the southern border of the Reservation and the other from I-15 to the northern portion of the lease study area. Where it leaves the Valley of Fire Highway, the southern access road would require no upgrades for the first 1.9 miles where its surface is approximately 28 feet wide. The next 0.9 miles of the road going east is approximately 10 feet wide and would require upgrading. From there, the access road would follow the Old Spanish Trail Road for about 1.3 miles to the northeast to the shared facilities area. This road is currently about 16 feet wide and would also need to be upgraded. The northern access road from I-15 is approximately 30 feet wide and would require no improvements.

Construction of the needed upgrades to the access roads would be conducted using the proposed techniques identified below. The existing access roads to the solar sites would be widened and improved as needed using a bulldozer or grader. Front-end loaders would be used to move the soil locally. Where upgrading is needed as identified above, the road surface would be widened to 24 feet with a 5-foot shoulder constructed on each side to facilitate drainage and to blend into the adjacent topography.

Following grading, the top 12 inches of the subgrade of the road could be scarified and moisture-conditioned and a roller would compact and smooth the ground surface. If needed, approximately 14 inches of Class 2 road base could be placed above the compacted subgrade, and it also could be moisture-conditioned and compacted.

After project construction, the upgraded permanent access roads would be used to provide access to the Projects. The installation of culverts and other road improvement amenities would be incorporated into the road design where needed on a site-by- site basis.

Disturbed areas where vegetation was removed during construction activities and that are no longer needed for future operation and maintenance of the road would be restored in a manner consistent with BIA and Tribal requirements to encourage natural revegetation.

2.4 Proposed Operation and Maintenance

Operation and maintenance activities associated with the Projects are minimal. The four Projects would be expected to collectively require up to 12 personnel during operations. Daily operation of the plant begins when there is sufficient sunlight to begin operation of the solar trackers. The panels would be facing east in the morning and rotate on the single axis to follow the sun throughout the day. In the evening, the trackers would be rotated back to the east using power from the electrical grid so that the panels are once again in position to receive the morning sun.

Maintenance and administrative staff would typically work 8-hour days, Monday through Friday. During periods when non-routine maintenance or major repairs are in progress, the maintenance force could work longer hours and contract labor could be utilized as necessary.

Long-term maintenance schedules would be developed to include periodic maintenance and equipment replacement in accordance with manufacturer recommendations. Solar panels are designed for a 35-year life. Solar panels and BESS components would be replaced as needed. Moving parts, such as motors and tracking module drive equipment would be serviced on a regular basis, and unscheduled maintenance would be conducted as necessary.

No heavy equipment would be used during normal plant operation. Operation and maintenance vehicles would include trucks (pickups, flatbeds, dump trucks), forklifts, and loaders for routine and unscheduled maintenance, and occasionally water trucks for solar panel washing. Large heavy-haul transport equipment may be brought to the site infrequently for equipment repair or replacement.

Operation of the Projects would be expected to generate only up to 10 to 15 round trips per day from maintenance and security personnel. Trips for water trucks to deliver water to the site to clean the panels could also occur but would be relatively infrequent as the panels could be cleaned only periodically. If panel washing were to occur, each event would generate up to 33 water truck trips. There could also be other deliveries of supplies or equipment that could occur to support operations and maintenance. This would result in a maximum of up to 34 daily round trips (during washing events) and more commonly less than one daily round trip during the operational phase of the Project. Potable water would be stored in a 15,000-gallon storage tank.

2.5 Proposed Project Decommissioning

The Projects would operate at a minimum for the life of their PPAs or other energy contracts as well as their lease with the Moapa Band. It is possible, because much of the needed electrical infrastructure would have been developed, the Projects would continue to be upgraded and used to generate solar energy even beyond the term of the initial energy purchase agreements and/or lease. Therefore, it is possible that the sites would remain in solar energy production for the foreseeable future.

If the Project were to be decommissioned, the solar field, support structures, and electrical equipment would be removed from the sites, and it would be revegetated as needed with native species.

Prior to decommissioning, a final restoration plan would be developed. It would be designed to meet the requirements applicable at that time and would include the following information:

- Goals and objectives of the plan

- Methods to be used to achieve site restoration
- Criteria to be used to determine the success or failure of the restoration
- Monitoring and maintenance of the site during and periodically after restoration
- What facilities and access routes would be removed, reclaimed and/or restored
- How facilities and access routes would be removed, and the disturbed areas restored
- The time of year the facilities and access routes would be removed and restored
- Noxious weed control during rehabilitation
- Stabilization and reclamation techniques to be used during restoration
- Annual reporting procedures
- Restoration implementation and monitoring schedule

2.6 Management Plans, Best Management Practices, and Minimization Measures

2.6.1 Management Plans

The following Management Plans would be prepared by the Applicants and would be submitted to the Moapa Band, BIA, BLM, and USFWS (as appropriate) for approval. Management plans not included as an appendix to this EIS will be prepared and approved prior to implementation of the Projects.

In addition, the Proposed Action for the four Projects includes BMPs intended to avoid or reduce environmental impacts associated with the Projects. These can be found in **Appendix C** of the DEIS. Additional resource-specific plans would also be developed and included as appendices to the DEIS. These plans are listed below:

- Site Restoration Plan
- Integrated Weed Management Plan
- Decommissioning Plan
- Traffic Management Plan
- Bird and Bat Conservation Strategy
- Raven Control Plan
- Gila Monster Reporting Protocol
- Desert Tortoise Translocation Plan
- Spill Prevention Control and Countermeasure Plan
- Emergency Response Plan
- Fire Management Plan
- Dust Abatement Plan
- Health and Safety Program
- Hazardous Materials and Waste Management Plan

- Stormwater Pollution Prevention Plan
- Site Drainage Plan
- Worker Environmental Awareness Program
- Unanticipated Discoveries Plan
- Blasting Plan (if needed)
- Helicopter Flight Safety Plan (if needed)

2.6.2 Minimization Measures

The following proposed minimization measures would be implemented as part of the Project proposed by the Applicant to avoid or reduce environmental impacts associated with the proposed action to federally protected species. Minimization will include the general conservation strategies (i.e., BMPs), as well as adhere to the specific desert tortoise minimization measures and comply with the terms and conditions of the USFWS BO issued for this Project.

2.6.2.1 Construction Minimization Measures

The following measures would be implemented to reduce effects on the desert tortoise and other terrestrial and avian wildlife species during construction, operation, and maintenance:

1. **Construction area flagging.** Work areas will be flagged prior to beginning construction activities and disturbance confined to the work areas. A biological monitor will escort all survey crews on site prior to construction. All survey crew vehicles will remain on existing roads and stay within the flagged areas to the maximum extent practicable. In cases where construction vehicles are required to go off existing roads, a biological monitor (on foot) will precede the vehicles.

2. **Desert tortoise fencing**. Temporary tortoise-proof fencing will be installed around the boundary of the solar facility. Biological monitors under supervision of an authorized biologist (approved by USFWS) will be present during fence installation to relocate all tortoises in harm's way to outside the work area. Additional clearance surveys and activities will be conducted after completion of the tortoise fence to ensure that no tortoises remain fenced inside the construction boundaries.

Fence specifications will be consistent with those approved by USFWS (USFWS 2009b). Installation of the temporary tortoise-proof fence would involve drive and crush construction techniques, where feasible, to minimize disturbance levels as much as possible. Tortoise guards will be placed at all road access points where desert tortoise-proof fencing is interrupted to exclude desert tortoises from the Project footprint. Gates or tortoise exclusion guards will be installed with minimal ground clearance and shall deter ingress by desert tortoises. The temporary tortoise-proof fencing will be removed once the Project is commissioned allowing tortoises to re-occupy the site during operations.

During the tortoise activity seasons (April – May, September - October), all new fences will be checked twice a day for the first two weeks after construction, or the first two weeks after tortoises become active if fence construction occurs in the winter, including once each day immediately before temperatures reach lethal thresholds. After the first two weeks, all tortoise exclusion fencing will be inspected monthly during construction, quarterly for the life of the Project, and immediately following all major rainfall events. Any damage to the fence will be repaired within two days of observing the damage.

3. **Field Contact Representative.** The BIA and Applicant will designate a Field Contact Representative (FCR) who will be responsible for overseeing compliance of the Terms and Conditions of the BO. The FCR will be onsite during all active construction activities that could result in the "take" of a desert tortoise. The FCR will have the authority to briefly halt activities that are in violation of the desert tortoise protective measures until the situation is remedied.

4. **Authorized desert tortoise biologist.** All authorized desert tortoise biologists (and monitors) are agents of BIA and USFWS and will report directly to BIA, USFWS, BLM, and the Applicant concurrently regarding all compliance issues and take of desert tortoises; this includes all draft and final reports of non-compliance or take. Authorized desert tortoise biologists, monitors, and the FCR will be responsible for ensuring compliance with all conservation measures for the Project as described in the BO. Prior to starting construction, authorized biologist(s) will submit documentation of authorization from the USFWS and approval of NDOW. Potential authorized desert tortoise biologists will submit their statement of qualifications to USFWS.

An authorized desert tortoise biologist will record each observation of a desert tortoise handled in the tortoise monitoring reports. This information will be provided directly to BIA, USFWS, and BLM.

5. **Biological monitoring.** Under supervision of an authorized biologist, biological monitors will be present at all active construction locations (not including the solar field after it has been fenced with desert tortoise fencing and clearance surveys have been completed). Desert tortoise monitors will provide oversight to ensure proper implementation of protective measures; record and report desert tortoises and tortoise sign observations in accordance with approved protocol; and report incidents of noncompliance in accordance with the BO and other relevant permits. The biological monitor(s) will survey the construction area to ensure that no tortoises are in harm's way. If a tortoise is observed entering the construction zone, work in the immediate vicinity will cease until the tortoise moves out of the area. Tortoises found above ground during construction activities will be moved offsite by an authorized biologist following the protocols described in the Desert Tortoise Translocation Plan.

6. **Desert tortoise clearance surveys and translocation.** After installation of tortoise fencing around the perimeter of the solar facility and prior to surface-disturbing activities, biological monitors and the authorized desert tortoise biologists who supervise them will conduct a clearance survey to locate and remove all desert tortoises from harm's way including those areas to be disturbed, using techniques that provide full coverage of construction zones (USFWS 2009b).

No surface-disturbing activities shall begin until two consecutive surveys find no live tortoises. In sectors or zones where a live tortoise is found, surveys will be repeated until the two-pass standard is met.

An authorized biologist will excavate burrows potentially containing desert tortoises located in the area to be disturbed with the goal of locating and removing all desert tortoises and desert tortoise eggs. Typical tortoise burrows have a characteristic shape with a flat bottom and arched top similar to a capital letter 'D' with the flat side down. Clearance will include evaluation of caliche caves and dens will also be evaluated, as tortoises are known to shelter there. Caliche is a naturally occurring hardened cemented soil composed of calcium carbonate, gravel, sand, and silt. The practice of excavating every obvious tortoise burrow will not be done as it has shown to be ineffective and inefficient in locating tortoises; instead, all obvious tortoise burrows will be scoped for presence and possible extraction. During clearance surveys, all handling of desert tortoises and their eggs and excavation of burrows shall be conducted solely

by an authorized desert tortoise biologist in accordance with the most current USFWS-approved guidance (USFWS 2009b). If any active tortoise nests are encountered, USFWS must be contacted immediately prior to removal of any tortoises or eggs from those burrows to determine the most appropriate course of action. Unoccupied burrows will remain in place to allow for tortoise use during operations. Outside construction work areas, all potential desert tortoise burrows and pallets within 50 feet of the edge of the construction work area will be flagged. If a desert tortoise occupies a burrow during the less-active season, the tortoise may be temporarily penned or will be translocated following USFWS approval, contingent upon weather conditions and health assessment results. No stakes or flagging will be placed on the berm or in the opening of a desert tortoise burrow. Desert tortoise burrows will not be marked in a manner that facilitates poaching. Avoidance flagging will be designed to be easily distinguished from access route or other flagging and will be designed in consultation with experienced construction personnel and authorized biologists. This flagging will be removed following construction completion.

An authorized desert tortoise biologist or biological monitor will inspect areas to be backfilled immediately prior to backfilling. Burrows with the potential to be occupied by tortoises within the construction area will be searched for presence. In some cases, a fiber optic scope will be used to determine presence or absence within a deep burrow.

A translocation plan following the 2019 guidance will be approved by the USFWS prior to the start of construction (USFWS 2019a). The plan identifies potentially suitable release areas, control site options, post-translocation densities, procedures for pre-disturbance clearance surveys and tortoise handling, as well as disease testing and post-translocation monitoring and reporting requirements. Tortoises found within 500 meters of the project boundary (fenceline) will be relocated outside of the nearest fence to a location that contains suitable habitat; tortoises found within the interior of the project site (>500 meters from a boundary fence) would be moved to temporary pens for the duration of construction and may be returned to the solar facility interior (as close to the original capture location as possible) as soon as construction activities are complete.

BIA and the Applicant will have an authorized biologist relocate tortoises following the USFWS- approved protocol (USFWS 2009b) and according to the approved translocation plan. If the USFWS releases a revised protocol for handling desert tortoises before initiation of Project activities, the revised protocol will be implemented. The relocation/translocation effort will adhere to the following procedures as well as those stipulated in the BO Terms and Conditions:

Tortoises found within the Project area will be relocated outside of the ROW to an area of suitable habitat as directed by the USFWS. Translocation will follow installation of exclusionary tortoise fence, as determined in coordination with the agencies. Translocation events will occur to specific locations outlined in the approved Project-specific translocation review package (TRP) and disposition plan, based on construction and translocation timing considerations for each tortoise. The Project will employ two strategies for translocating tortoises, depending on the initial capture location of each animal.

1. **Short-distance Relocations:** Tortoises found within 500 meters of the solar site fenceline or within the gen-tie construction area would be relocated to areas immediately outside of the Project's temporary exclusion fencing or outside of harm's way in the vicinity of the gen-tie ROW. Following the completion of construction, the exclusion fencing would be removed; the permanent site fencing would be permeable to desert tortoises and existing vegetation on the Project site is expected to be left relatively intact during construction and operation of the Project. Therefore,

the short-distance translocation strategy is designed to allow tortoises to freely re-occupy the site following construction.

2. **Indirect Translocation or return to project site:** Tortoises found in the interior of the solar site fenceline (>500 meters from the exclusion fence) would be moved to temporary pens for the duration of construction and may be returned to the solar facility interior (as close to the original capture location as possible) as soon as construction activities are complete. Penned tortoises may be translocated to an alternate suitable location following construction, as determined on a case-by-case basis through consultation with the USFWS.

- An authorized biologist will perform health assessments and draw blood samples for each tortoise to be relocated. Blood testing will determine whether any desert tortoise suffer from upper respiratory tract disease (URTD).

- Tortoises will be temporarily tagged with combination global positioning system (GPS)/radio-transmitter tags so that the tortoise can be retrieved and handled as directed by the USFWS if the results of blood work indicate that a tortoise is infected with URTD.

- When determining a release location for an individual tortoise, release site preference will be to find a like-for-like shelter resource. Every attempt will be made to find similar cover sites and habitat to that at the location of each individual on the Project site, otherwise all translocatees shall be released at the most appropriate and available unoccupied shelter sites (e.g., soil burrows, caliche caves, rock caves, etc.). Because of the impermanent nature of soil burrows and cave availability, prior to submitting the final Disposition Plan and determining exact areas of release, potential release sites will be re-investigated for existing burrows and caliche or rock caves that can be used for shelter sites. Known active/inactive tortoise burrows discovered during the surveys would be re-investigated for this purpose. If insufficient shelter sites exist in an area to be used for translocation, the Applicant shall coordinate with the agencies to determine the most appropriate course of action, such as reviewing an alternate release site, modifying/improving existing burrows and partial burrows, or artificially creating burrows per USFWS protocols, prior to translocation. The number of artificial burrows per translocated tortoise will be included in the TRP/Disposition Plan, as feasible, and may include more than one burrow per tortoise to increase translocation success (i.e. tortoises remaining within their release locations). The disposition of relocated tortoises will be evaluated and reported on following the Terms and Conditions of the BO.

- If a tortoise voids its bladder while being handled, it will be given the opportunity to rehydrate before release. Tortoises will be offered fluids by soaking in a shallow bath, or an authorized desert tortoise biologist will administer nasal-oral fluid or injectable epicoelomic fluids. Any tortoise hydration support beyond offering water or shallow soaking would only be provided by an authorized biologist who has received advanced training in health assessments and been specifically approved by USFWS for these procedures.

7. **Biological Sample Archiving.** Any samples collected during desert tortoise health assessments that are not used for tests would be archived with UCLA, and appropriate fees would be paid by the Applicant. The fee would be assessed at the time of sample collection and adjusted for inflation using the Bureau of Labor Statistics' consumer price index. As of October 2020, the archiving fee amount was $3,000.

8. **Integrated Weed Management Plan**. Prior to construction, an Integrated Weed Management Plan will be developed that includes measures designed to reduce the propagation and spread of designated noxious weeds, undesirable plants, and invasive plant species, or as determined by the cooperating or reviewing agencies (BIA, BLM, NDOW, etc.). Measures in the plan will include, but are not limited to the following:

- Areas with current weeds will be mapped. Topsoil with the presence of weeds will not be salvaged and reused elsewhere in the Project. The topsoil from such areas will be disposed of properly.

- Inspect heavy equipment for weed seeds before they enter the Project area. Require that such equipment be cleaned first to remove weed seeds before being allowed entry. Clean equipment that has been used in weed infested areas before moving it to another area.

- Any straw or hay wattles are used for erosion control must be certified weed free.

9. **WEAP.** A WEAP will be presented to all personnel onsite during construction. This program will contain information concerning the biology and distribution of the desert tortoise, desert tortoise activity patterns, and its legal status and occurrence in the proposed Project area. The program will also discuss the definition of "take" and its associated penalties, measures designed to minimize the effects of construction activities, the means by which employees limit impacts, and reporting requirements to be implemented when tortoises are encountered. Personnel will be instructed to check under vehicles before moving them as tortoises often seek shelter under parked vehicles. Personnel will also be instructed on the required procedures if a desert tortoise is encountered within the proposed Project area. WEAP training will be mandatory, as such, workers will be required to sign in and wear a sticker on their hardhat to signify that they have received the training and agree to comply.

10. **Internal Site Access roads.** Construction access will be limited to the Project area and established access roads. Vehicle travel off established internal site access roads will be minimized as practicable.

11. **Speed limits and signage.** Until the desert tortoise fence has been constructed, a speed limit of 15 miles per hour will be maintained during the periods of highest tortoise activity (March 1 through November 1) and a limit of 25 mph during periods of lower tortoise activity. This will reduce dust and allow for observation of tortoises in the road. Speed-limit and caution signs will be installed along access roads and service roads. After the tortoise proof fence is installed and the tortoise clearance surveys are complete, speed limits within the fenced and cleared areas will be established by the construction contractor and based on surface conditions and safety considerations and remain with limits established by USFWS in the BO.

12. **Trash and litter control.** Trash and food items will be disposed properly in predator proof containers with resealing lids. Trash will be emptied and removed from the Project site on a periodic basis as they become full. Trash removal reduces the attractiveness of the area to opportunistic predators such as ravens, coyotes, and foxes. Measures to reduce the subsidy of ravens and other avian predators/scavengers are discussed in greater detail in the Raven Control Plan (**Appendix I** of the DEIS).

13. **Raptor control.** The applicant will inspect structures annually for nesting ravens and other predatory birds and report observations of nests to the USFWS and BIA. Transmission line support structures and other facility structures will be designed to discourage their use by raptors for perching or nesting (e.g., by use of anti-perching devices) in accordance with the most current APLIC guidelines (APLIC 2006, 2012). In addition to increasing desert tortoise protection, following these guidelines during transmission line construction will reduce the possibility of avian electrocution and other hazards.

14. **Overnight hazards.** No overnight hazards to desert tortoises (e.g., auger holes, trenches, pits, or other steep-sided depressions) will be left unfenced or uncovered; such hazards will be eliminated each day prior to the work crew and monitoring biologists leaving the site. All excavations will be inspected for trapped desert tortoises at the beginning, middle, and end of the workday, at a minimum, but will also be continuously monitored by a biological monitor or authorized biologist. Should a tortoise become entrapped, the authorized biologist will remove it immediately.

When outside of the fenced areas of the Project site, Project personnel will not move construction pipes greater than 3 inches in diameter if they are stored less than 8 inches above the ground until they have inspected the pipes to determine the presence or absence of desert tortoises. As an alternative, the Applicant may cap all such structures before storing them outside of the fenced area.

15. **Blasting.** If blasting is required in desert tortoise habitat, detonation will only occur after the area has been surveyed and cleared by an authorized desert tortoise biologist no more than 24 hours prior. A 200-foot radius buffer area around the blasting site will be surveyed and all desert tortoises above ground within this 200-foot buffer of the blasting site will be moved 500 feet from the blasting site, placed in unoccupied burrow, and temporarily penned to prevent tortoises that have been temporarily relocated from returning to the site. Tortoises located outside of the immediate blast zone and that are within burrows will be left in their burrows. All burrows, regardless of occupied status, will be stuffed with newspapers, flagged, and location recorded using a global positioning system (GPS) unit. Immediately after blasting, newspaper and flagging will be removed. If a burrow or cover site has collapsed that could be occupied, it will be excavated to ensure that no tortoises have been buried and are in danger of suffocation. Tortoises removed from the blast zone will be returned to their burrow if it is intact or placed in a similar unoccupied or constructed burrow.

16. **Penning.** Tortoises may be held *in-* or *ex-situ* (e.g., if temperatures do not allow for translocation, or if tortoises do not pass the health assessment) for a maximum of 12 months. Previously constructed and approved enclosure pens are present adjacent to the Project site and would be used if any quarantine is necessary. Quarantine is not the preferred option for tortoises to be translocated and would only be used as necessary, in coordination with USFWS. This penning is not the same as the temporary penning described in the blasting measure.

17. **Stormwater Pollution Prevention Plan.** The applicant will oversee the establishment and functionality of sediment control devices as outlined in the stormwater pollution prevention plan.

18. **Tortoise Encounters During Construction.** If a tortoise is injured as a direct or indirect result of Project construction activities, it shall be immediately transported to a veterinarian or wildlife rehabilitation facility and reported within 24 hours or the next workday to the Service. Any Project construction-related activity that may endanger a desert tortoise shall cease in the area if a desert tortoise is encountered on the Project site. Project construction activities may resume after an

Authorized Biologist removes the desert tortoise from danger or after the desert tortoise has moved to a safe area.

2.6.2.2 Operations and Maintenance Minimization Measures

The following minimization measures will be implemented during O&M of the Proposed Action to reduce effects on the desert tortoise and other species:

19. **WEAP Training.** WEAP training will be required for all O&M staff for the duration of the Project. In addition to an overview of minimization measures, the training will include specific BMPs designed to reduce effects to the desert tortoise. All Project personnel will check under vehicles or equipment before moving them. If Project personnel encounter a desert tortoise, they will avoid the tortoise. The desert tortoise will be allowed to move a safe distance away prior to moving the vehicle

20. **Biological Monitoring.** A biological monitor(s) will be present during ground-disturbing and/or off-road O&M activities outside of the fenced solar facility to ensure that no tortoises are in harm's way. Tortoises found above ground during O&M activities will be avoided or moved by an authorized biologist, if necessary. Pre-maintenance clearance surveys followed by temporary exclusionary fencing also will be required if the maintenance action requires ground or vegetation disturbance. A biological monitor will flag the boundaries of areas where activities would need to be restricted to protect tortoises and their habitat. Restricted areas will be monitored to ensure their protection during construction.

21. **Speed Limits.** Speed limits within the Project area, along gen-tie line routes, and access roads will be restricted to less than 25 mph during O&M. Speed limits in the solar facility will be restricted to 15 mph during O&M.

22. **Trash and Litter Control and Other Predator Deterrents.** Trash and food items will be disposed properly in predator proof containers with resealing lids. Trash will be emptied and removed from the Project site on a periodic basis as they become full. Trash removal reduces the attractiveness of the area to opportunistic predators such as ravens, coyotes, and foxes. To reduce attractants for birds, open containers that may collect rainwater will be removed or stored in a secure or covered location.

2.6.2.3 Decommissioning Minimization Measures

The same minimization measures used for construction will be used for decommissioning.

2.6.3 Compensatory Mitigation

The applicant will pay the following required compensatory mitigation requirement:

23. **Habitat Compensation.** Prior to surface disturbance activities within desert tortoise habitat, the Project proponent will pay a one-time remuneration fee (per acre of proposed disturbance). The remuneration fees will be submitted to the account that USFWS designates in the BO. The compensation for habitat loss under Section 7 of the Endangered Species Act (ESA) is an annually adjusted rate, currently $936/acre (subject to change annually on March 1).

24. **Habitat Use Study.** The Project proponent will work with the University of Nevada, Las Vegas (UNLV), U.S. Geological Survey (USGS), or other agency to design and implement a 2-3-year study to compare on-site and off-site desert vegetation and climate (e.g., annual and perennial plant growth

and cover, ambient temperature) to address metrics of habitat change, including how desert tortoises use the vegetation on site for forage and cover. Perennial vegetation sampling along 50-meter line-intercept transects would occur on the project site prior to ground-disturbing activities in coordination with the USFWS. Results from tortoise monitoring as approved in the Project's Desert Tortoise Translocation Plan (in draft) would inform the tortoise use portion of this study.

3 ACTION AREA AND EXISTING CONDITIONS

3.1 Action Area

Section 7 (a)(2) of the ESA defines the "Action Area" as the areas to be affected directly or indirectly by the federal action. For these Projects, the Action Area is defined as 1) the up to 6,500 acres of direct impacts within the lease study area, 2) the approximately 35 miles of ROWs (approximately 708 acres) for the gen-tie line (Option 1 is used to show worst-case impacts), site access roads, temporary water pipeline, and existing road providing access to gen-tie ROW, and 3) the area of indirect impacts for the recipient site, or release zones for short- and long-distance tortoise translocations (the fenceline encompassing up to 6,500 acres, plus 500-meter release zone (approximately 2,674-acre release zone), plus a 1.5 km buffer (approximately 10,665-acre release zone buffer)(**Figure 3-1**).

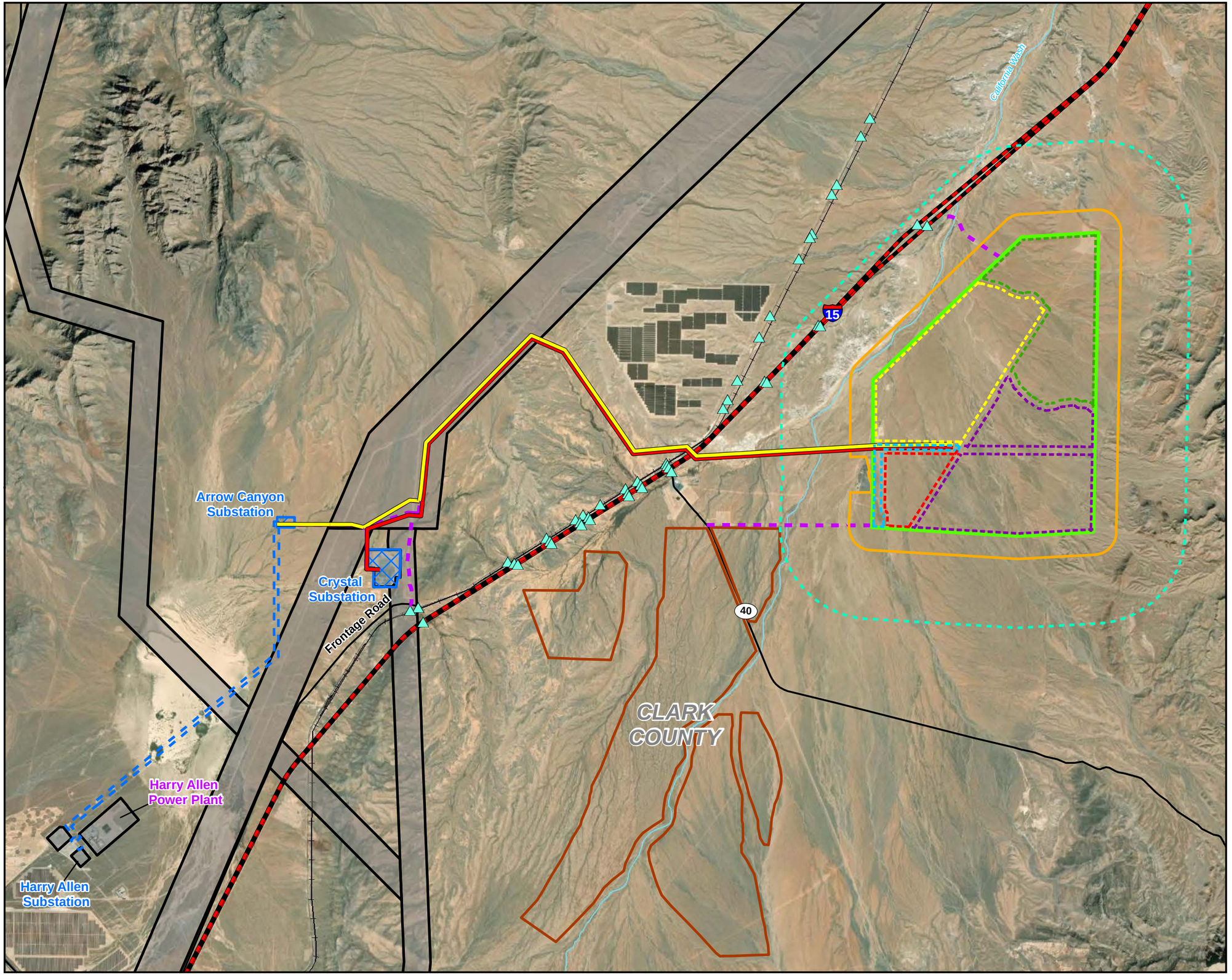
The Action Area is located within the Mojave Desert approximately 30 miles north-northeast of Las Vegas, Nevada, largely within the Moapa River Indian Reservation. The Mojave Desert is cooler and wetter than the Sonoran Desert to the south and warmer and drier than the high-elevation Great Basin Desert to the north (Brown 1994).

The Mojave Desert receives less than 13 inches (254 mm) of rain a year and is generally between 3,000 and 6,000 feet (910 and 1,800 m) in elevation. The Mojave Desert is an area with temperature extremes and four distinct seasons. Winter months bring temperatures dipping to below 20°F (-7°C) on valley floors, and below 0°F (-18°C) at higher elevations. Storms moving from the Pacific Northwest can bring rain and snow across the region — more often, the rain shadow created by the Sierra Nevada as well as mountain ranges within the desert such as the Spring Mountains result in storms that bring only clouds and wind. In longer periods between storm systems, winter temperatures in valleys can approach 80°F (27°C).

The Mojave Desert occupies portions of southeastern California, southern Nevada, southwestern Utah and northwestern Arizona. The Mojave Desert region, and the area surrounding the Action Area specifically, displays typical basin and range topography.

3.2 Habitat and Vegetation

Land cover types in the study area were identified using the Southwest Regional GAP Analysis Project data (Lowry et al. 2005; USGS 2005), which uses satellite imagery to delineate land cover types (vegetation communities). Vegetation in the study area is primarily composed of Sonoran-Mojave Creosotebush-White Bursage Desert Scrub (creosotebush scrub), while North American Warm Desert Wash (desert wash), Sonoran-Mojave Mixed Salt Desert Scrub (salt scrub), Invasive Southwest Riparian Woodland and Shrubland, North American Warm Desert Pavement, North American Warm Desert Bedrock Cliff and Outcrop, and Developed, Medium – High Intensity account for the remainder of the vegetation in the study area. Disturbed areas, both within and adjacent to the Action Area, are associated with multiple dirt roads and less impacted offroad vehicle trails, the industrial facility immediately west of the lease area, railroad and interstate highway (along the gen-tie options) and substations in the western portion of the gen-tie options. **Table 3-1** lists the acreages of the various vegetative cover types occurring within the Project areas.



Legend

Project Components

- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Approved ROW Arrow Canyon - Harry Allen
- Chuckwalla 1A
- Chuckwalla 1B
- Chuckwalla 2
- Chuckwalla 3
- Shared Facilities

General Features

- Culvert
- Interstate
- Major Highway
- Railroad
- Stream / River
- Existing Substation
- Designated Utility Corridor
- Recipient Site - Release Zone
- Recipient Site - Buffer
- Gemini Solar Project

0 0.5 1 1.5

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 11 North, Meters

Chuckwalla Solar Projects

FIGURE 3-1
ACTION AREA

Map Extent: Clark County, Nevada

Date: 11-05-21		Author: rnc

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Table 3-1 - Major Vegetation Communities in the Project Areas

Project Component	Sonora-Mojave Creosotebush-White Bursage Desert Scrub (acres)	North American Warm Desert Wash (acres)	Sonora-Mojave Mixed Salt Desert Scrub (acres)	North American Warm Desert Bedrock Cliff and Outcrop (acres)	North American Warm Desert Pavement (acres)	Invasive Southwest Riparian Woodland and Shrubland (acres)	Developed, Medium – High Intensity (acres)	Total (acres)
On-site Solar Project Components								
Chuckwalla 1a Solar Field	1,074; 54%	902; 46%	0	0	0	0	0	1,976
Chuckwalla 1b Solar Field	409; 85%	71; 15%	0	0	0	0	0	480
Chuckwalla 2 Solar Field	1,144; 73%	428; 27%	0	0	0	0	0	1,572
Chuckwalla 3 Solar Field	1,791; 78%	516; 22%	0	0	0	0	0	2,307
Chuckwalla Shared Facilities Area	80; 48%	86; 52%	0	0	0	0	0	166
On-site Solar Project Components Total	**4,498; 69%**	**2,003; 31%**	**0**	**0**	**0**	**0**	**0**	**6,501**
Off-site Components								
Gen-tie Option 1	341; 62%	185; 34%	0	2; <1%	13; 2%	5; <1%	3; <1%	549
Gen-tie Option 2	99; 55%	76; 42%	0	1; <1%	1; <1%	4; 2%	0	181
Site Access Roads	8; 80%	1; 10%	0	0	0	0	1; 10%	10
Temporary Water Pipeline	3; 30%	4; 40%	1; 10%	1; 10%	1; 10%	0	0	10

Project Component	Sonora-Mojave Creosotebush-White Bursage Desert Scrub (acres)	North American Warm Desert Wash (acres)	Sonora-Mojave Mixed Salt Desert Scrub (acres)	North American Warm Desert Bedrock Cliff and Outcrop (acres)	North American Warm Desert Pavement (acres)	Invasive Southwest Riparian Woodland and Shrubland (acres)	Developed, Medium – High Intensity (acres)	Total (acres)
Existing Road providing access to Gen-tie ROW	1; 25%	3; 75%	0	0	0	0	0	4
Off-site Components Total	**452; 60%**	**269; 36%**	**1; <1%**	**4; <1%**	**15; 2%**	**9; 1%**	**4; <1%**	**754**
On- and Off-site Components Total	**4,950; 68%**	**2,272; 31%**	**1; <1%**	**4; <1%**	**15; <1%**	**9; <1%**	**4; <1%**	**7,255**

Sources: USGS 2005, Lowry et al. 2005

3.2.1 Sonoran-Mojave Creosotebush-White Bursage Desert Scrub

Creosotebush scrub is typical of the Mojave Desert and is the most abundant vegetation community in the region and within the Action Area. Creosotebush scrub occurs on well-drained sandy flats and bajadas from 150 to 1500 meters elevation in Nevada. Its range extends from the Colorado River on the south to Pahranagat Valley on the north (Wildlife Action Plan Team 2012). This community is typically dominated by creosotebush and white bursage, which can be sparse to moderately dense (2-50 percent cover). Many other shrubs, dwarf-shrubs, and cacti may be present, often as a sparse understory. In southern Nevada, common species include saltbush (*Atriplex spp.*), Mormon tea (*Ephedra nevadensis*), desert wolfberry (*Lycium andersonii*), brittlebush (*Encelia farinosa*), and beavertail cactus (*Opuntia basilaris*). The herbaceous layer is typically sparse but can be abundant with ephemerals after spring rains. Herbaceous species common in the region include phacelia (*Phacelia spp*.), desert trumpet (*Erigonium inflatum*), cryptantha (*Cryptantha spp*.), and low woollygrass (*Dasyochloa pulchella*) (USGS 2005).

Creosotebush is used by many desert animals for shelter and forage. Creosotebush roots help to stabilize the soil and support burrows for a variety of reptiles and amphibians, including the desert tortoise and mammals such as the kit fox (*Vulpes macrotis*). Other animals bed in or under the bushes, and birds use them for perching and nesting (Wildlife Action Plan Team 2012).

3.2.2 North American Warm Desert Wash

This community is generally restricted to the ephemeral washes within the Project area, though there is a large belt of desert wash vegetation throughout the northwest portion of lease study area. The vegetation in desert washes is highly variable, ranging from sparse and patchy to moderately dense. It typically occurs along the banks of washes but may occur within the channel. The woody layer is typically intermittent and relatively open and is usually dominated by shrubs and small trees such as catclaw (*Senegalia greggii*) and desert willow (*Chilopsis linearis*) (USGS 2005). In southern Nevada, washes tend to support a higher diversity and density of cacti and yucca than the surrounding landscape. Vegetation surveys conducted for previously approved solar projects on the Reservation (BIA 2012, 2014, 2016, 2020a, 2020b, 2021) identified numerous cacti and yucca species including cholla (*Cylindropuntia spp.*), barrel cactus (*Ferocactus cylindraceus*), hedgehog cactus (*Echinocereus engelmannii var. chrysocentrus*) and Mojave yucca (*Yucca schidigera*). Higher densities of big galleta grass (*Pleuraphis rigida*) are also commonly reported in washes in this region.

3.2.3 Sonoran-Mojave Mixed Salt Desert Scrub

This community is typical of saline basins in the Mojave Desert and most often occurs around the edge of playas. Vegetation is typically composed of one or more saltbush species and other halophytic (salt tolerant) plants such as iodinebush (*Allenrolfea occidentalis*), seepweed (*Suaeda spp.*), and alkali sacaton (*Sporobolus airoides*) (USGS 2005). Salt scrub vegetation is restricted to a very small area along the temporary water pipeline.

3.2.4 North American Invasive Southwest Riparian Woodland and Shrubland

This community represents areas that are dominated by introduced woody species such as saltcedar and Russian olive (*Elaeagnus angustifolia*). Due to the lack of perennial water in the lease area, this vegetation is limited to a few small patches of saltcedar along larger drainages along the gen-tie option paths within the designated utility corridor.

3.2.5 North American Warm Desert Pavement

The Warm Desert Pavement community is composed of unvegetated to sparsely vegetated (<2 percent) landscapes. This community is common in flat, open basins where exposure to wind has developed a cover of fine to medium gravel coated with "desert varnish." These areas are subject to extreme temperature variation and support very limited populations of desert scrub species such as creosotebush (*Larrea tridentate*) and Eastern Mojave buckwheat (*Eriogonum fasciculatum*). However, these areas may briefly experience high densities of ephemeral herbaceous vegetation following seasonal precipitation events. This vegetation community occupies a very small area along the two gen-tie options and the temporary water pipeline.

3.2.6 North American Warm Desert Bedrock Cliff and Outcrop

This vegetation community includes barren, sparsely vegetated (less than 10 percent cover) landscapes of cliff faces, narrow canyons, and smaller outcrops of various bedrock types, as well as scree and talus slopes. Although vegetation density may be low, species diversity can be high, and may include beargrass (*Nolina bigelovii*), teddybear cholla (*Cylindropunita bigelovii*), and other succulents. Lichens may be the predominant life form in some areas, and small patches of shrubs from adjacent areas may also be present (USGS 2005). This vegetation community occupies a very small area along the temporary water pipeline.

3.2.7 Developed, Medium – High Intensity

The developed community is composed of areas that have been highly disturbed by human activities. These areas consist of roadways and other developed areas and occur along the two gen-tie options and the site access roads.

3.3 Wildlife

Species observed in the Action Area during biological surveys for nearby projects on the Reservation included birds, mammals and a variety of reptiles. Commonly observed avian species include: black-throated sparrow (*Amphispiza bilineata*), ash-throated flycatcher (*Myiarchus cinerascens*), black-tailed gnatcatcher (*Polioptila melanura*), loggerhead shrike (*Lanius ludovicianus),* common raven (*Corvus corax*), burrowing owl (*Athene cunicularia*), red tailed-hawk (*Buteo jamaicensis*) and lesser nighthawk (*Chordeiles* sp.). Small mammal residents include kangaroo rats (*Dipodomys spp.*), pack rats (*Neotoma cinerea*) and white-tailed antelope squirrels (*Ammospermophilus leucurus*). Common larger mammals may include coyotes (*Canis latrans*), kit foxes (*Vulpes macrotis*), and black-tailed jackrabbits (*Lepus californicus*). Reptiles include western whiptail lizards (*Aspidoscelis tigris*), side-blotched lizards (*Uta stansburiana*), horned lizard (*Phrynosoma* sp.), desert iguana (*Dipsosaurus dorsalis*), bull snake (*Pituophis catenifer sayi*), coachwhip (*Masticophis flagellum*) and desert tortoise.

3.4 Ground Water Resources

The Proposed Action is in the Colorado River Basin Region of Nevada's Hydrographic Regions. The Colorado River Basin is one of the larger hydrographic regions in Nevada, covering 5,612 square miles and includes 27 hydrographic areas. The Action Area is located in and around the area called Arrow Canyon Range Cell. The hydrogeology of the Arrow Canyon Range Cell is recognized as unique yet poorly understood (Mifflin and Associates 2001). Seven groundwater management basins are superimposed on the Arrow Canyon Range cell. The Arrow Canyon Range Cell is composed of a series of north-south trending structural blocks related to extensional faulting that are almost entirely composed of Paleozoic

carbonate rock (BIA 2012). The Action Area is located within the California Wash hydrographic basin, which is an unconsolidated sand and gravel aquifer.

The basin is a westward-thickening section of Paleozoic carbonate rocks, in part unconformably overlain by generally fine-grained sediments of the Muddy Creek Formation (Longwell et al. 1965). The carbonate-rock terrain that constitutes the Arrow Canyon Range Cell incorporates both recharge areas and one major spring discharged area and is bounded by generally less permeable basin or bedrock lithologies. The California Wash Basin around the Action Area is around 5,000 feet thick (BIA 2012). Regional patterns of precipitation combined with terrain elevation results in the highest mountain ranges receiving the majority of precipitation that becomes recharge. The carbonate terrain is efficient in retaining a relatively high percentage of precipitation as recharge.

Groundwater data from several Reservation monitoring and test wells in the vicinity of the Action Area indicate the static water level ranges in depth from 354 to 526 feet below the surface and the wells yielding over 1,000 gallons per minute (gpm; BIA 2012). Pump and step-drawdown testing of the carbonate aquifer yielded a range of transmissivity of 50,000 to 100,000 ft./day, hydraulic conductivity of 20 ft./day and specific yield (Sy) of 0.03 to 0.008 (BIA 2012).

4 DESCRIPTION OF SPECIES

Only one federally listed species under the ESA was documented within or near the Projects: the Mojave desert tortoise. **Section 4.3** lists details of the survey protocol and the results. Other species considered for analysis are described in **Section 4.1**.

No Designated Critical Habitat for any listed plant or animal species occurs within the Action Area, though critical habitat units for the desert tortoise occur approximately 12 miles west of the Action Area on the west side of the Arrow Canyon Range.

4.1 Federally Listed Bird Species

4.1.1 Yellow-billed Cuckoo

On October 3, 2014, the yellow-billed cuckoo (*Coccyzus americanus*) was listed as threatened under the ESA (79 FR 59992; USFWS 2014). Critical habitat was designated for the yellow-billed cuckoo on April 21, 2021; the nearest designated critical habitat for this species is located approximately 135 miles south-southeast of the Projects. The yellow-billed cuckoo has always been rare in Nevada. There are still small areas of suitable habitat within the state, with documented breeding occurring very rarely in Southern Nevada. Yellow-billed cuckoos may still utilize remnant habitats present within the state during migration.

Based on historic accounts, the species was widespread and locally common in California and Arizona, locally common in a few river reaches in New Mexico, locally common in Oregon and Washington, and locally uncommon in scattered drainages of the arid and semiarid portions of western Colorado, western Wyoming, Idaho, Nevada, and Utah. The scattered cottonwoods on the Colorado River tributaries (Virgin, Muddy, and Pahranagat) are the last places in Nevada where the yellow-billed cuckoo can potentially occur. The only known nesting sites in Nevada for the yellow- billed cuckoo are at Warm Springs Ranch Natural Area along the Muddy River in the Moapa Valley (SNWA 2019), approximately 11.5 miles north-northwest of the Action Area. While two individual cuckoos were detected during 2019 surveys at Warm Springs Natural Area, there is no suitable habitat for the species in the Action Area.

4.1.2 Yuma Ridgway's (Clapper) Rail

The Yuma Ridgway's rail (*Rallus longirostris yumanensis*) was listed as an endangered species on March 11, 1967 (32 FR 4001). The Recovery Plan was finalized in 1983 and portions of the recovery action plan were initiated over the ensuing years. The Yuma Ridgway's rail is one of the smaller subspecies of clapper rail, with adult males standing eight inches tall and weighing 266.8 grams on average (Todd 1986). Females are slightly smaller. Adult Yuma Ridgway's rails of both sexes are similar in plumage; they possess a long, slender bill and long legs and toes compared to body size (Todd 1986).

The present range of the Yuma Ridgway's rail in the U.S. includes portions of Arizona, California, and Nevada. The Yuma Ridgway's rail lives in freshwater marshes dominated by cattail (*Typha* sp.) and bulrush (*Scirpus* ssp.) with a mix of riparian tree and shrub species (*Salix exigua*, *S. gooddingii*, *Tamarix* sp., *Tessaria serica*, and *Baccaris* sp.) along the shoreline of the marsh (Eddleman 1989). This species is known to occur along the Muddy River within the Overton Wildlife Management Area approximately 14 miles east of the Action Area. No suitable habitat for this species occurs within the Action Area.

4.1.3 Southwestern Willow Flycatcher

The southwestern willow flycatcher (*Empidonax traillii extimus)* was listed by the USFWS as an endangered species within its entire range on February 27, 1995 (FR 60: 10693-10715). Critical habitat for the species was originally established in 1997 (FR 62: 39129-39147) but subsequently vacated and incidental protection provided along the Virgin River and its 100-year floodplain from the Arizona/Nevada border to Halfway Wash in Nevada (FR 65: 4140-4156).

Critical habitat was again proposed on October 12, 2004 (FR 69: 60706-60736), redefined and re-instituted in 2005 (FR 70: 60886-61009; USFWS 1997), and designated in 2013 (USFWS 2013). Critical habitat for the southwestern willow flycatcher in Nevada is currently limited to portions of the Virgin River above its confluence with the Muddy River (FR 70: 60886-61 009).

For nesting, southwestern willow flycatchers require dense riparian habitats with microclimatic conditions dictated by the local surroundings. Saturated soils, standing water, or nearby streams, pools, or cienegas are a component of nesting habitat that also influences the microclimate and density of the vegetation component. No suitable riparian or microhabitat conditions exist within the Action Area. The closest known breeding habitat for this species is located along the Muddy River, at Warm Springs Ranch, approximately 12 miles north-northwest of the Action Area. During 2019 surveys that were not project-specific (i.e., not conducted for the Chuckwalla Projects), eight southwestern willow flycatcher territories were identified, including two confirmed pairs, three unpaired residents and one non-resident (SNWA 2019). There is no suitable habitat for the species in the Action Area.

4.2 Moapa Dace

The Moapa dace was listed as an endangered species under the ESA on March 11, 1967 (32 Federal Register [FR] 4001; USFWS 1967). Since the Moapa dace represents a monotypic genus, this species was assigned a recovery priority of 1 (highest ranking) by the USFWS in 1995. The original recovery plan for this species was prepared in 1983 (USFWS 1983) and subsequently revised in 1995 (USFWS 1996a).

4.2.1 Distribution and Life History

The Moapa dace is endemic to and occurs in the Muddy (Moapa) River system (and associated thermal spring systems). Specifically, it occurs in the Warm Springs area which encompasses 10 thermal spring provinces that form the Muddy River (roughly 11 miles north-northwest of the proposed Projects). Moapa dace likely inhabited 25 springs and approximately 16 kilometers of the upper Muddy River (Ono et al. 1983). Historically, the Muddy River was 48.4 kilometers long; however, in 1935, with the completion of the Hoover Dam, Lake Mead flooded the lower 8 kilometers of the river, rendering it unsuitable for Moapa dace. Previous surveys found adult Moapa dace occurring in low numbers in restricted portions of 3 springs and less than 2 miles of spring outflow and river in the Warm Springs area (USFWS 1983).

The Moapa dace inhabits a variety of habitats throughout its several life stages. As individuals age, they occupy habitats with increasing flow velocities such that larval dace are apparently limited to slackwater portions of the upper reaches of tributaries of the Muddy River, whereas adults can be found in the river's mainstem. The species prefers warmer temperatures (67-89.6°F); thus, cooler temperatures in the middle portion of the Muddy River mainstem may function as a barrier to downstream movements (USFWS 1996b).

The species is omnivorous; stomach contents have included beetles, moths, butterflies, true flies, leaf hoppers, true bugs, caddisflies, mayflies, damselflies, dragonflies, worms, scuds, crustaceans, snails, filamentous algae, vascular plants, detritus and sand. The dace primarily forages on drift items but will also forage on the stream or spring substrate. The species often forages from drift stations in large groups (up to 30 individuals). These sites are often characterized by overhanging vegetation or particularly deep areas (USFWS 1996b).

4.2.2 Threats to the Species

Threats to the Moapa dace include habitat loss and alteration, introduction of non-native species, and parasites. Habitat loss and alteration has been ongoing in the Warm Springs areas for the purposes of recreational, industrial and municipal projects. Several headwater springs were completely channelized or diverted for use as swimming pools. Irrigation for agricultural purposes historically had impacts on headwater springs in the Warm Springs area, though agricultural activity in the area has declined.

Moapa dace persist within several warm springs and associated springbrooks that have been altered greatly by humans. Downstream habitats, where adult dace from different spring systems mixed historically, are now infested with exotic predatory fish. In many cases infested habitats are intentionally blocked from upstream areas by fish barriers built to prevent the spread of exotic fish. Specifically, a fish barrier (known as the refuge barrier) and a water diversion exist along the Muddy River south of the Warm Springs area. The resulting fragmented population structure threatens the dace's genetic and demographic health, although barriers must be maintained until the threats of exotic fish are eliminated (USFWS 2009a).

4.2.3 Critical Habitat

There is no designated critical habitat for the Moapa dace.

4.3 Desert Tortoise

Desert tortoise was listed as threatened under the ESA on April 2, 1990 (USFWS 1990). A total of 6.4 million acres of Critical Habitat was designated in 1994 (USFWS 1994). The 1994 Recovery Plan described a strategy for recovering the desert tortoise, which included the identification of six recovery units, recommendations for a system of Desert Wildlife Management Areas within the recovery units, and development and implementation of specific recovery actions. Within those six recovery units, Desert Wildlife Management Areas (DWMAs) were identified, where populations of tortoises facing similar threats would be managed with the same strategies.

The Action Area is within the Northeastern Mojave Recovery Unit, which encompasses almost 5 million acres extending from southwestern Utah/northwestern Arizona (northern boundary) to Las Vegas/Las Vegas Wash (southern boundary). This unit includes the Beaver Dam Slope, Gold Butte-Pakoon, and Mormon Mesa Critical Habitat Units.

Characteristically, tortoises in this unit are active in late summer and early autumn in addition to spring, reflecting the fact that this region receives up to about 40 percent of its annual rainfall in summer and supports two distinct annual floras on which tortoises can forage (USFWS 2019c). Desert tortoise also feed on cacti, perennial grasses, and herbaceous perennials. Desert tortoises may den together in caliche caves in bajadas, washes, or caves in sandstone rock outcrops (USFWS 2011, USFWS 2019c).

If basic habitat requirements are met, the desert tortoise can survive and reproduce within the varied vegetation communities of the Mojave region (USFWS 1994). These requirements include sufficient suitable plants for forage and cover, suitable substrates for burrow and nest sites, and freedom from disturbance. Throughout most of the Mojave region, the desert tortoise occurs primarily on flats and bajadas with soils ranging from sand to sandy-gravel characterized by scattered shrubs and abundant inter-shrub space for herbaceous plant growth. Desert tortoises are also found on rocky terrain and slopes.

4.3.1 Distribution and Abundance in the Action Area

4.3.1.1 Field Surveys

To assess the status of the desert tortoise in the Action Area, two separate field surveys were conducted in 2020. The first survey was conducted in September and October and covered the entire approximately 6,500-acre solar lease area that includes Chuckwalla 1a, 1b, 2, 3, and the shared facilities area. The second survey took place in November 2020 and covered the entire gen-tie survey area (Heritage 2021a). Team members included qualified biologists and more than one biologist who had been previously approved by USFWS as an Authorized Biologist on multiple prior projects. To be granted authorized status, USFWS requires that the biologist has thorough knowledge of desert tortoise behavior, natural history, and ecology, and demonstrates substantial field experience and training to successfully:

- Handle desert tortoises
- Excavate burrows to locate desert tortoise or eggs
- Relocate desert tortoises
- Reconstruct desert tortoise burrows
- Unearth and relocate desert tortoise eggs
- Locate, identify, and record all forms of desert tortoise sign; and
- Follow USFWS-approved protocols.

The lease study area was surveyed in accordance with current USFWS protocols (USFWS 2019a). Biologists walked 10-meter (33-foot) wide parallel pedestrian transects. USFWS refers to this methodology as “100 percent coverage.” The lease study area was approximately 6,500 acres in size. The objective of the field survey is to determine presence or absence of desert tortoises, estimate the number of tortoises (abundance) and assess the distribution of tortoises within the Action Area (USFWS 2019a).

Observations of tortoise sign (live tortoises, carcasses, shell, bones, scutes, scat, burrows, pallets, tracks, egg shell fragments, etc.) were recorded in the field.

4.3.1.2 Field Survey Results

Data collected within the survey area were analyzed using the USFWS 2019 Protocol equation to determine the estimated number of tortoises within the Action Area. This method uses the number of tortoises observed above ground, the probability that a tortoise is above ground, the probability of detecting a tortoise if above ground, and the size of the area surveyed. Calculations of desert tortoise populations are based only on the number of adult tortoises (≥180 mm MCL) observed during surveys. This equation is not used for linear features, so the gen-tie study area is excluded from the relative abundance calculations. The equation is illustrated below.

$$\left(\begin{array}{c}\text{Estimated number of tortoises}\\ \text{within action area}\end{array}\right) = \frac{\left(\begin{array}{c}\text{Number of tortoises}\\ \text{observed above ground}\end{array}\right)}{\left(\begin{array}{c}\text{Probability that}\\ \text{a tortoise is}\\ \text{above ground } (P_a)\end{array}\right)\left(\begin{array}{c}\text{Probability of}\\ \text{detecting a tortoise,}\\ \text{if above ground } (P_d)\end{array}\right)}\left(\frac{\text{Size of action area}}{\text{Size of area surveyed}}\right)$$

A total of 648 east-west transects of differing lengths were walked over the course of the survey to achieve 100% coverage of the survey area, totaling approximately 2,606 kilometers of transect length. Desert tortoise and desert tortoise sign were observed. A total of 50 adult desert tortoises (≥180 mm MCL) and 3 juveniles were observed over the course of the surveys (**Table 4-1** and **Figure 4-1**). Desert tortoise sign (scat, carcasses/shell fragments, tracks and burrows) were observed throughout the survey area. Sign is included in **Table 4-2**. The estimated number of adult tortoises within the entire Action Area was calculated to be 94.1, with a 95% confidence interval of approximately 54.78 to 163.29 adult tortoises during the 2020 surveys. This information is included for each Project in **Table 4-1** below. Desert tortoise health assessments were conducted within the Project Areas in the fall of 2021 (Hinderle 2021). More tortoises were found during health assessments (64 adults and 21 juveniles) resulting from different survey methods and more time spent surveying. One of these tortoises was located within Chuckwalla 1b, which had no tortoises discovered during fall 2020 surveys. Additional information can be found in the survey report (Heritage 2021a, Hinderle 2021).

These results are generally consistent with USFWS recent findings presented in the Revised Recovery Plan for the Mojave Population of the Desert Tortoise (2011). The NE Mojave Recovery Unit was found to be the only unit that increased in abundance from 2004 through 2014 (Allison and McLuckie 2018).

Table 4-1 – Desert Tortoise Observations and Density Estimates by Project (2020 Survey)

Project	Number of Adults Observed	Number of Juveniles Observed	Estimated Number of Tortoises within Each Project Area	95% Confidence Interval (Lower – Upper)
Chuckwalla 1a (including Shared Facilities Area)	7	0	13.9	7.18 – 27.06
Chuckwalla 1b	0	0	n/a	n/a
Chuckwalla 2	11	1	20.5	10.61 – 39.76
Chuckwalla 3	32	2	59.7	36.99 – 96.47
Chuckwalla Off-site Components	0	0	n/a	n/a
Totals	**50**	**3**	**94.1**	**54.78 – 163.29**

Source: Heritage 2021a

Table 4-2 – Desert Tortoise Sign – Entire Action Area

Sign Type	Total – Gen-tie Survey Area	Total – Solar Projects Survey Area	Total – Both Survey Areas
Burrows[1]			
Class 5	0	0	0
Class 4	0	8	8
Class 3	3	106	109
Class 2	20	472	492
Class 1	1	79	80
Total	**24**	**665**	**689**
Pallets			
Class 5	0	0	0
Class 4	0	0	0
Class 3	0	1	1
Class 2	0	8	8
Class 1	0	0	0
Total	**0**	**9**	**9**
Carcasses[2]			
Class 5	0	17	17
Class 4	0	10	10
Class 3	0	7	7
Class 2	0	3	3
Class 1	1	11	12
Total	**1**	**48**	**49**
Scat[3]			
Class 5	0	3	3
Class 4	0	23	23
Class 3	0	80	80
Class 2	7	46	53
Class 1	5	1	6
Total	**12**	**153**	**165**
Eggshells	2	16	18
Total	**2**	**16**	**18**
Dig Marks/Tracks	0	31	31
Total	**0**	**31**	**31**

Source: Heritage 2021a

[1] Burrow Class Definitions: 1. currently active, with tortoise or recent tortoise sign. 2. good condition, definitely tortoise; no evidence of recent use. 3. deteriorated condition; definitely tortoise. 4. good condition; possibly tortoise. 5. deteriorated condition; possibly tortoise.

[2] Shell Remains: 1. fresh or putrid. 2. normal color; scutes adhere to bone. 3. scutes peeling off bone. 4. shell bone is falling apart; growth rings on scutes are peeling. 5. disarticulated and scattered.

[3] Scat: 1. wet (not from rain or dew) or freshly dried; obvious odor. 2. dried with glaze; some odor; dark brown. 3. dried; no glaze or odor; signs of bleaching (light brown), tightly packed material. 4. dried; light brown to pale yellow, loose material; scaly appearance. 5. bleached, or consisting only of plant fiber.

Moapa River Indian Reservation

California Wash

15

40

TL-11

TL-8

JPTL-5

Crystal Substation

Frontage Road

100 112 113 116 171 217 175 207 242 229 355 357 443 776 335 452 406 431 493 530 503 398 561 440 521 587 517 595 613 632 647 654 651 791 702 718 814 744 824 855 840 888 848 950 929 996 992 1004 1015 1065 1061 1064 1044

Project Components

- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Study Area
- Chuckwalla 1a
- Chuckwalla 1b
- Chuckwalla 2
- Chuckwalla 3
- Shared Facilities

General Features

- Existing Substation
- Interstate
- Major Road
- Railroad
- Stream or River

Jurisdictional Land Ownership

- Bureau of Land Management Land
- Indian Land

Survey Results

- Live Desert Tortoise - Adult
- Live Desert Tortoise - Juvenile
- Live Desert Tortoise - Adult (Outside Survey Area)
- Live Desert Tortoise - Juvenile (Outside Survey Area)

0 0.5 1 1.5 2

Miles

Universal Transverse Mercator
North American Datum 1983
Zone 12 North, Meters

Chuckwalla Solar Projects

Figure 4-1 - Desert Tortoise Observations

Map Extent: Clark County, Nevada

Date: 10-12-21 | Author: rnc

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4.3.2 Factors That May Affect the Desert Tortoise in the Action Area

4.3.2.1 Upper Respiratory Tract Disease

Upper respiratory track disease (URTD) was discovered in 1990 and is currently a major cause of mortality in the western Mojave Desert population. Habitat degradation, poor nutrition, and drought have increased the desert tortoises' susceptibility to this disease (USFWS 1994). It is thought that URTD is transmitted between desert tortoise populations when desert tortoises are captured as pets, then subsequently released.

4.3.2.2 General Anthropogenic Factors

The factors causing the decline of the desert tortoise are primarily human related. These factors include collection of desert tortoises for pets, food, and commercial trade; collision with vehicles on roads and highways; mortality from gunshots; predation; and off-road vehicle (ORV) travel cross-country or on trails. Predation by the common raven is severe on younger age classes of desert tortoise. The Breeding Bird Survey (BBS) data from 1968 to 2004 indicated increases in the raven populations of more than 700 percent in the west Mojave Desert and more than 70 percent in the East Mojave Desert (Boarman and Kristan 2006). Increased food supplies from road kills, landfills, trash, garbage dumps, agricultural development and new perch and nest sites all contribute to the increased population of ravens. Berry (1990) speculated that raven predation has resulted in such high juvenile desert tortoise loss in some portions of the Mojave that recruitment of juveniles into the adult population has been halted. Within or near the Project areas, previous disturbance from OHV travel, weeds and ground disturbance from multiple linear facilities such as pipelines, roads, and transmission lines, and disturbance from several existing facilities such as substations, solar fields, and an industrial facility were observed.

4.3.2.3 Connectivity

Habitat connectivity is important to maintain desert tortoise access to required resources (e.g., water or burrow sites), minimize energetic expenditures to access resources, limit risk of travel- related injury or death by minimizing the need to move through risky or uninhabitable areas, maintain social behaviors and gene flow, and enable movement with a change in environmental conditions, such as climate shift (Webster et al. 2002; Lowe and Allendorf 2010). In a review of numerous definitions of habitat connectivity published in the scientific literature, Kindlmann and Burel (2008) defined habitat connectivity simply as “the ease with which individuals can move about within a landscape.” This definition encompasses both structural (based entirely on landscape configuration independent of the animal) and functional connectivity (including animal responses to landscape features). It is important to note that natural barriers—such as rivers or mountains—often can limit habitat connectivity. In addition to natural barriers, human structures including housing developments, roads, farmland, and fences have increasingly reduced habitat connectivity (Fahrig 2003). This reduced connectivity has resulted from both habitat destruction and fragmentation, the division of habitat into smaller, discontinuous units.

Factors in assessing the potential effects of the Projects on desert tortoise habitat connectivity include:

- Natural barriers to tortoise movement
- Anthropogenic barriers to tortoise movement
- Habitat fragmentation

Genetic connectivity can be defined as the degree to which gene flow is maintained between populations. For gene flow to occur across an area, populations of desert tortoises need to be connected by areas of suitable habitat that support sustainable numbers of reproductive individuals. Natural barriers, such as

mountain ranges and rivers, reduce genetic connectivity and are thought to have partly resulted in some broad-scale genetic differentiation among tortoise populations within the Mojave Desert (Averill-Murray et al. 2013). In the Action Area, there are currently no natural barriers that would affect genetic connectivity from the east. Tortoise movement to the north, northwest and west may be hindered by Interstate 15, which runs approximately 1 mile northwest of the Action Area, 1.5 miles to the north, and 2.25 miles to the west. To the south, movement may be limited by Valley of Fire Highway (State Route 40) which runs approximately 2.75 miles to the south of the Action Area. Genetic connectivity is currently maintained as tortoises can exchange genetic material with populations in suitable habitat areas east of the Project areas as well as within the areas that are immediately north and south of the Projects.

4.3.2.4 Habitat Fragmentation

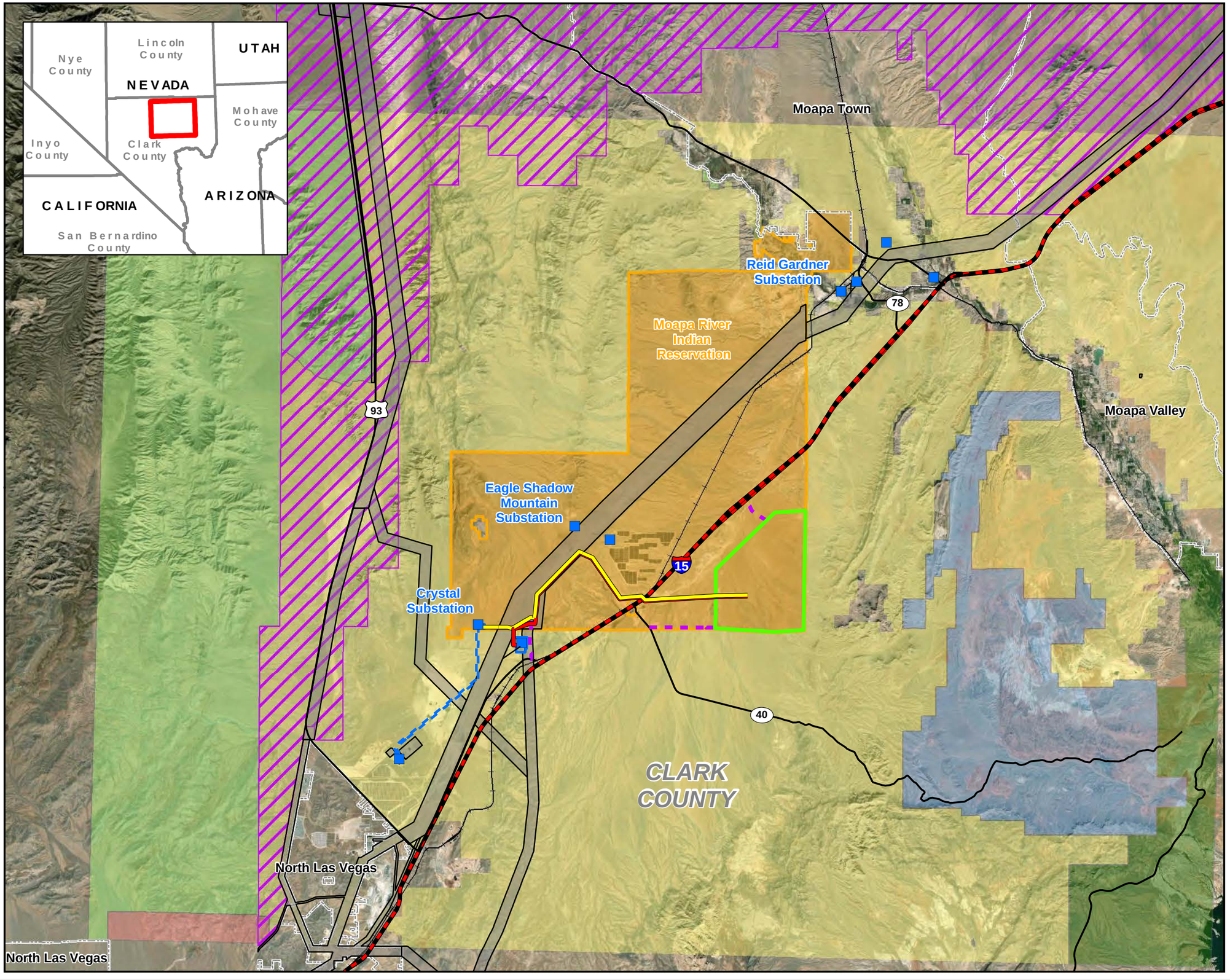
The Proposed Project is not expected to substantively contribute to habitat fragmentation because it would be built with a raised fence that would allow tortoises to re-inhabit and pass through the solar site during operations.

4.3.3 Desert Tortoise Designated Critical Habitat

In 1990, USFWS listed the desert tortoise as threatened over 30 percent of its geographic range. In response to this listing, the *Desert Tortoise (Mojave Population) Recovery Plan* was created to aid in the preservation of the species. In this plan, six population units termed "recovery units," were identified using available data on genetic variability, morphology, ecosystem types, and population behavior.

Within these recovery units, 14 desert wildlife management areas (DWMA) were identified as areas where tortoise populations could be managed for recovery. The guidelines used to delineate the 14 DWMAs were used by USFWS to designate federally protected desert tortoise "Critical Habitat" in 1994. Of the original 22,616 to 27,407 square kilometers recommended for protection in the 14 DWMAs, 26,087 square kilometers became Designated Critical Habitat (DCH). Primary constituent elements of DCH for the desert tortoise are those physical and biological attributes that are necessary for the long- term survival of the species. These elements were identified as: 1) sufficient space to support viable populations within each of the five Recovery Units and to provide for movement, dispersal, and gene flow; 2) sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species; 3) suitable substrates for burrowing, nesting, and overwintering; 4) burrows, caliche caves, and other shelter sites; 5) sufficient vegetation for shelter from temperature extremes and predators; and, 6) habitat protected from disturbance and human-caused mortality (USFWS 2011).

The Project areas are not located within USFWS desert tortoise DCH (USFWS 2019b). **Figure 4-2** depicts the nearest DCH, which is approximately 12 miles west and northwest of the proposed Projects.



Legend

Project Components

- Gen-Tie Route to Arrow Canyon Substation
- Gen-Tie Route to Crystal Substation
- Access Road
- Chuckwalla Solar Lease Area
- Approved ROW Arrow Canyon - Harry Allen

General Features

- Existing Substation
- Interstate
- Major Highway
- Railroad
- Designated Utility Corridor
- Municipal Boundary
- Existing Substation

Jurisdictional Land Ownership

- Bureau of Land Management
- Indian Land
- Fish and Wildlife Service
- Department of Defence
- State Lands
- National Park Service

Critical Habitat

- Desert tortoise

0 1 2 3 4 5
Miles

North American Datum 1983
State Plane Nevada East Feet

Chuckwalla Solar Projects

Figure 4-2 - Desert Tortoise Designated Critical Habitat

Map Extent: Clark County, Nevada

Date: 10-13-21		Author: rnc

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5 EFFECTS OF THE PROPOSED ACTION AND DETERMINATION OF EFFECTS

This section presents the potential direct, indirect, and cumulative effects of the Proposed Action on listed species. Impacts resulting from the implementation of the Proposed Action include:

- Injury of mortality of desert tortoises from construction activities;
- Temporary stress on desert tortoises from handling during relocation efforts;
- Temporary constriction of movement corridors for desert tortoises during construction;
- Disturbance from vibrations during construction that could affect tortoises near the boundary of the construction area;
- Temporary and permanent loss of desert tortoise habitat and burrows;
- Disturbance and displacement of desert tortoises during construction of the associated site access roads and proposed gen-tie lines;
- Potential noise and lighting effects on tortoise behavior and movement;
- Introduction of weeds and invasive species within the construction area during construction and operation;
- Exposure to chemicals (herbicides, palliatives and spills from equipment);
- Potential increased raven and other predator populations resulting from perches provided by the solar structures, gen-tie lines and transmission towers, and perimeter fencing, and human introduction of trash within or near the Action Area boundary;
- Groundwater use from the same hydrographic basin that supports the Yuma Ridgway's rail, southwestern willow flycatcher and Moapa dace.

5.1 Federally Listed Bird Species

5.1.1 Yellow-billed Cuckoo

There is no suitable habitat in the Action Area (including proposed critical habitat), and no habitat would be removed or affected by the Proposed Action. Suitable habitat occurs approximately 11.5 miles north-northwest of the Project area near the Warm Springs Ranch, and individuals were observed there in 2019 (SNWA 2019). Suitable habitat also occurs approximately 18 miles east of the Action Area along the Virgin River. While few yellow-billed cuckoos are known to occur in these areas, they may use the Muddy and Virgin Rivers for migration to and from breeding habitat and for dispersal. The Proposed Projects have no gen-tie lines in the vicinity of these rivers; therefore, those individuals would not be at risk of colliding with aboveground electrical lines. While groundwater withdrawals may result in insignificant reductions in flow in the Muddy River, the magnitude of effects would be too small to affect yellow-billed cuckoo or cuckoo habitat (e.g., riparian vegetation)(see analysis in **Section 5.3**).

Determination

Due to the low number of yellow-billed cuckoos that occur near the Action Area and the lack of habitat in the Project areas, the potential for direct mortality to this species is low. Potential risk would be

insignificant and discountable and potential indirect effects would be negligible. The Proposed Action may affect, but is not likely adversely affect, the yellow-billed cuckoo.

5.1.2 Yuma Ridgway's (Clapper) Rail

There is no suitable Yuma Ridgway's rail habitat in the Action Area. Therefore, the potential for direct mortality to this species is low. This species is known to occur along the Muddy River within the Overton Wildlife Management Area. Critical habitat has not been designated for this species. While the nearest suitable habitat is approximately 14 miles from the Project areas, rails may use the Muddy and Virgin Rivers for migration to and from breeding habitat and for dispersal but the Proposed Projects have no gen-tie lines near these rivers; therefore, those individuals would not be at risk of colliding with aboveground electrical lines. While groundwater withdrawals may result in insignificant reductions in flow in the Muddy River, the magnitude of effects would be too small to affect Yuma Ridgway's rail habitat (e.g., hydrophytic vegetation) (see analysis in **Section 5.3**).

There have been two isolated incidents involving Yuma Ridgway's rail near solar projects. One mortality was discovered near the solar field at a PV solar project in Riverside County, California. Field data collected in connection with that incident failed to provide evidence of any direct impact or collision with a PV module. Another Yuma Ridgway's rail mortality was discovered at a PV solar project in Imperial County, California. In this instance too, there was no evidence of a collision with a PV module.

In response to these incidents, USFWS addressed the potential for solar projects to result in injury or mortality to Yuma Ridgway's rail in an incidental take statement for a project in Imperial County, California. The USFWS recognized that interactions between Yuma Ridgway's rail and PV facilities are improbable when such projects are distant from this species' habitat. The USFWS concurred with the BLM's finding that the project, located near the Colorado River in Riverside County, California, was "not likely to adversely affect" Yuma Ridgway's rail. Similar to the Chuckwalla Projects, that project area did not include aquatic habitat for Yuma clapper rail and was not located in a flight path that would connect aquatic features. A portion of U.S. breeding populations is known to migrate annually to wintering grounds in northwest Mexico (Harrity and Conway 2020). However, we do not have information about and cannot predict the paths migrating (or dispersing) individuals may take and there is no evidence to indicate that dispersal of these species would occur in the Action Area.

The low number of known recorded mortalities, lack of habitat in the Action Area and the long distance from any known occurrences suggests the low potential for direct mortality to listed birds related to the Projects. Potential direct and indirect effects posed by the Projects are negligible.

While groundwater withdrawals may result in insignificant reductions in flow in the Muddy River, the magnitude of effects would be too small to affect Yuma Ridgway's rail or its habitat (e.g., riparian vegetation)(see analysis in **Section 5.3**).

Determination

Due to the low number of Yuma Ridgway's rail mortalities at PV solar facilities and the lack of habitat in or near the Action Area, the potential for direct mortality to this species is low. Potential risk would be insignificant and discountable and potential indirect effects would be negligible. The Proposed Action may affect, but is not likely adversely affect, the Yuma Ridgway's rail.

5.1.3 Southwestern Willow Flycatcher

There is no suitable habitat in the Action Area for southwestern willow flycatchers. Therefore, the potential for direct mortality to this species is negligible. There is no designated critical habitat in the Action Area. Suitable habitat occurs approximately 12 miles north-northwest of the Action Area near the Warm Springs Ranch and potential breeding was observed there in 2019 (SNWA 2019).

While few southwestern willow flycatchers are known to occur near the Warm Springs area, they may use the Muddy River for migration to and from breeding habitat and for dispersal but the Proposed Projects have no gen-tie lines near the Muddy or Virgin Rivers; therefore, those individuals would not be at risk of colliding with aboveground electrical lines. While groundwater withdrawals may result in insignificant reductions in flow in the Muddy River, the magnitude of effects would be too small to affect southwestern willow flycatcher or its habitat (e.g., riparian vegetation; see analysis in **Section 5.3**).

Determination

Due to the low number of southwestern willow flycatchers that occur near the Action Area and the lack of habitat in the Project areas, the potential for direct mortality to this species is low. Potential risk would be insignificant and discountable and potential indirect effects would be negligible. The Proposed Action may affect, but is not likely adversely affect, the southwestern willow flycatcher. No proposed or designated critical habitat is within the Action Area; therefore, the Projects would have no effect to designated critical habitat.

5.2 Desert Tortoise

5.2.1 Injury and Mortality

An estimated 94.1 adult desert tortoises are expected to occupy the entire Action Area (95% CI: 54.78 – 163.29 based on 2019 USFWS protocol calculations [USFWS 2019a]). Therefore, construction of the Proposed Action may result in impacts to up to 164 adult desert tortoises through injury or direct mortality of desert tortoise. Such injury or mortality could occur from vehicle strikes or other adverse interactions with Project-related equipment. However, translocation of tortoises and the implementation of avoidance and minimization measures are expected to avoid all or most of these potential injuries or mortalities.

Beside the initial construction, O&M activities inside and outside the solar sites could represent a source of ongoing mortality. As such, direct take of desert tortoises resulting from these activities is expected to be very low.

5.2.2 Relocation, Translocation and Handling

Temporary desert tortoise exclusion fencing would be installed by phase prior to construction and desert tortoises would be relocated via clearance surveys before the construction phases of the Projects. Clearance surveys would be conducted for Chuckwalla 1a and 1b first and translocations would occur for both Projects at the same time. Clearance surveys and translocations for Chuckwalla 2 and 3 would occur further into the future and at different times. Tortoises would be relocated to Tribal lands and/or BLM lands within the Action Area as described in the Project's translocation plan. Relocation of desert tortoises can potentially represent take via harassment and/or mortality, as there is a possibility for tortoises to be killed or injured as a result of this process. It is expected that all tortoises would be captured and safely released.

5.2.3 Loss of Occupied Habitat

The Proposed Action includes the installation of temporary desert tortoise exclusion fencing around the solar facilities, utilizing gates and cattle guards (with ramps) at ingress/egress locations. The temporary desert tortoise fencing would be constructed in phases with each Project phase (Phase 1 includes Chuckwalla 1a, 1b and the shared facilities area, and Phase 2 includes Chuckwalla 2 and 3). The permanent perimeter fence for each Project would be constructed inside of the exclusion fencing and would remain permeable to tortoise movements. Exclusion fencing would be removed from each Project and phase after construction, allowing tortoises to move onto and through each site during operations, except around the substation, O&M area and BESSs, where the exclusion fencing would remain intact.

Vegetation would be cleared along site access roads, at the Project substations and the O&M building, at inverters, and along cable trenches. However, most native vegetation within the solar arrays would be left in place during construction. Equipment would drive and crush vegetation as needed, preserving the integrity of root balls and up to 18 inches of photosynthetic material, allowing it to regrow after construction. Tall shrubs would be trimmed to allow for installation of panels. Native vegetation would remain in the solar arrays during operations and would provide suitable habitat for tortoises during operations.

A total of approximately 431 acres of occupied desert tortoise habitat would be permanently disturbed and up to approximately 4,777 acres would be temporarily disturbed as a result of Project implementation.

Construction equipment would not operate beyond the fenced boundary. Roads outside of the Project areas that are not designated as open by the Applicant and Tribe are not to be used by Project personnel unless accompanied by a biological monitor.

The Proposed Projects are not expected to substantively contribute to habitat fragmentation because the preservation of native vegetation on site and a permeable fence would allow tortoises to re-occupy the site after construction.

The Project activities would not have direct or indirect effects on the physical characteristics of designated critical habitat that are required to support the recovery of the species because there is no designated critical habitat within the Action Area.

5.2.4 Constriction of Movement

The Proposed Action is currently located in an area where desert tortoise movement is generally unrestricted; Tortoise movement to the west and northwest is hindered by Interstate 15 which is a permeable barrier because there are culverts that allow for some level of tortoise movement under the Interstate (**Figure 3-1**). Temporary exclusionary fencing would be installed around the perimeter of the sites by Project phase in order to exclude tortoises during construction. The exclusionary fencing would restrict desert tortoise movement on the site during construction (approximately 20 months for each phase) but would not preclude north-south movement or east-west movement around the exclusionary fencing due to large quantities of similar habitat surrounding the Projects. The exclusionary fencing surrounding the phase 1 Projects would be removed after construction is complete in anticipation that tortoises would re-inhabit the solar sites while the construction of the second phase is ongoing, depending on the length of time it takes for vegetation to regrow and when the subsequent phases occur. During operations, tortoises would be allowed to re-inhabit and move freely through the solar arrays of both phases.

Given the existing natural and anthropogenic barriers, because most vegetation would be maintained on the Project site, and the perimeter fence would remain permeable during operations to allow tortoises to occupy and move through the solar arrays, Project activities would be unlikely to further reduce genetic connectivity in the area.

5.2.5 Vibration and Noise

Equipment that would cause surface disturbance and otherwise operate during construction would be limited to what would be needed to grade dirt access roads, equipment to install solar arrays, trenching equipment for installation of cable and wiring and equipment to install the operations building and the proposed electric substations. Areas outside of the exclusion fence may experience short-term vibrations and increased noise that could potentially disturb desert tortoises. Noise and vibration would be temporary and sporadic. Construction taking place near the perimeter edge of the exclusion fence is limited. Ground-disturbing activities during O&M would be substantially less than during construction of the Proposed Action, such that no adverse effects on desert tortoise from ground vibration or noise are expected to occur during O&M.

5.2.6 Dust

Construction activities and O&M vehicle traffic on the roads within the Action Area could generate dust that could affect vegetation adjacent to the Action Area in the short-term; long-term adverse effects on vegetation are not expected to occur. The buildup of dust on plant leaves could affect photosynthetic productivity and nutrient and water uptake resulting in loss of potential foraging plants for desert tortoises. It is assumed that this low-level dusting effect during construction would be minimal and most likely washed away during rainstorms. Construction BMPs would be in place to monitor and decrease dust pollution, if required, by use of polymeric stabilizers in the soil or with frequent watering with water trucks or other means.

5.2.7 Lighting

Temporary lighting would be used during construction for nighttime activities. There may also be mobile lighting located at entrances during construction. Lighting would likely be used more during the wintertime to ensure safe working conditions for personnel. Minimal lighting would be used on-site and would be directed inward and downward. Site lighting would include motion sensor lights at the O&M area for security purposes. Lighting used on-site would be of the lowest intensity foot candle level, in compliance with any applicable requirements from the Moapa Band, measured at the property line after dark. The Projects' lighting system would provide operation and maintenance personnel with illumination for both normal and emergency conditions near each main entrance, the Project substations, and at the BESS facilities. Lighting would be designed to provide the minimum illumination needed to achieve safety and security objectives and would be downward facing and shielded to focus illumination on the desired areas only. There would be no lighting in the solar field except for emergency lighting at the BESS facilities. Therefore, light trespass on surrounding properties would be minimal. If lighting at individual solar panels or other equipment is needed for night maintenance, portable lighting would be used. Project lighting is not expected to have a more than negligible effect on desert tortoises near and adjacent to the Proposed Action.

5.2.8 Edge Effects

The edge effect is the effect of the juxtaposition or placing side by side of contrasting environments on an ecosystem. This term is commonly used in conjunction with the boundary between natural habitats and disturbed or developed land. The Proposed Action includes placement of a temporary exclusionary

perimeter fence during construction. Other than impacted burrows or desert tortoises that need to be relocated during fence construction we assume that there would be no permanent or long-term edge effects as a result of the Proposed Action. The fence may create roosting sites for ravens or birds of prey; these effects would be mitigated through the preparation and implementation of a Raven Control Plan (**Appendix I** of the DEIS). Measures that are included in the Raven Control Plan to manage ravens include: preventing access to anthropogenic food and water sources; garbage management; prohibitions on intentionally feeding ravens; limiting availability of water; raptor-friendly designs or retrofits on utility poles that will discourage or eliminate the potential for raptor nests that could also be used by ravens; inactive raven nest removal; limiting raven attractants; raven hazing; utility structure removal following decommission; perch deterrents; annual inspections of potential nesting sites; and active raven nest buffers.

5.2.9 Introduction of Weeds and Invasive Species

Introduction of weeds and invasive species would be controlled using an Integrated Weed Management Plan and would prevent or minimize the spread/colonization of weeds onsite and off-site. Invasive species could be introduced to the area via transport by construction vehicles and equipment. The ground would be disturbed during construction providing increased opportunity for weed establishment, though much less than if the site were to be fully graded. The Integrated Weed Management Plan (**Appendix F** of the DEIS) would identify management and operational practice to avoid the introduction or spread of existing invasive species within the Action Area. The goal of this plan would be to minimize potential effects from weeds and invasive species within the Action Area and adjacent lands, as well as to avoid adverse effects on desert tortoise foraging habitat off-site. Implementation of this plan would result in no adverse effects on desert tortoises from weeds or invasive species within the Action Area or on adjacent lands.

5.2.10 Exposure to Chemicals

The primary wastes generated at the Projects during construction, operation, and maintenance would be nonhazardous solid and liquid wastes. Limited quantities of hazardous materials would be used and stored on the solar sites. The BESS could include lithium-ion batteries that would need replacement periodically and the used batteries would need to be disposed of according to appropriate protocols. The primary hazardous materials on site during construction would be the fuels, lubricating oils and solvents associated with construction equipment. The nonhazardous wastes produced by construction and O&M activities would include defective or broken electrical materials and batteries, empty containers, the typical refuse generated by workers and small office operations, and other miscellaneous solid wastes. The types of wastes and their estimated quantities will be discussed in a hazardous materials plan that will be developed for the Projects.

Prior to construction, the Applicant will prepare a Spill Prevention and Emergency Response Plan that addresses waste and hazardous materials management, including BMPs related to storage, spill response, transportation, and handling of materials and wastes. Waste management would emphasize the recycling of wastes where possible and would identify the specific landfills that would receive wastes that cannot be recycled.

Mechanical treatment of weeds is the preferred method for the Projects; however, herbicides may be used if necessary. Herbicide use would follow those approved in BLM's Programmatic EIS (PEIS) for Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on BLM Managed Lands in 17 Western States (BLM 2007, BLM 2017). The herbicides that may be used in mowed areas, based on those allowed on BLM lands, include aminopyralid, clopyralid, imazapyr, imazapic, glyphosate, metasulfuron

methyl, and rimsulfuron. The applicant would implement a Site Restoration Plan and an Integrated Weed Management Plan that specifies procedures for managing vegetation and minimizing the spread of non-native and noxious weeds, including integrated pest management and use of herbicides. Standard Operating Procedures (SOPs) would be incorporated into the Integrated Weed Management Plan (**Appendix F** of the DEIS) and implemented. Herbicides that are believed to have deleterious effects on reptiles, such as 2,4-D, would not be allowed. Any herbicide use would be used during the less active tortoise season.

Water is the preferred method for reducing dust for the Projects; however, palliatives may be used in permanent disturbance areas at the beginning of construction where tortoises have been excluded. Approved palliatives for use in desert tortoise habitat include Road Bond 1000, Soil Cement (for roads and heavy traffic areas), Formulated Soil Binder (FSB) 1000 (for non-traffic areas on finer soils) and Plas-Tex (For non-traffic areas on sandier/rockier soils). Since palliatives would only be used in areas where tortoises have been excluded, they should not come into contact with these substances.

5.2.11 Attraction of Human Subsidized Predators

Avian predators and scavengers such as the common raven and canids benefit from a myriad of resource subsidies provided by human activities as a result of substantial development within the desert as compared to undeveloped desert landscapes (Boarman and Sazaki 1996). These subsidies can include food (e.g. garbage), water (e.g. temporary water ponds), nesting substrates (e.g. transmission lines and fencing), and safety from inclement weather or predators (e.g. buildings). Ravens and other predators may be attracted to elevated structures associated with the Proposed Action such as the perimeter fencing, gen-tie line poles and the buildings in the O&M area. There is a potential for increased sources of food, trash or water both during construction and operation of the Projects, particularly at facilities where people concentrate; however, a Raven Control Plan (**Appendix I** of the DEIS) was developed and would be approved prior to the initiation of construction activities. It addresses trash and litter control. These would reduce or eliminate potential raven (or other avian predators) related impacts to desert tortoises.

5.2.12 Operations and Maintenance

Because the solar sites would be enclosed with permeable fencing and most vegetation would be maintained on the sites during operations, it is likely that tortoises would pass through the solar sites and reoccupy them to some extent, though the extent to which tortoise would reoccupy the sites is unknown at this time. The presence of desert tortoises on the solar sites may result in take (injuries or death). Tortoises may be injured or killed during routine maintenance of facilities inside by maintenance vehicles on the solar sites. Minimization measures, such as biological monitors for ground disturbing activities, speed limits, and WEAP, would help to minimize impacts to desert tortoise during these routine maintenance activities (Refer to **Section 2.6**).

Determination

Implementation of the Proposed Action may affect, and is likely to adversely affect, the desert tortoise in the Action Area. This determination is based on the following considerations:

- Construction-related impacts on the desert tortoise could include direct mortality or injury as a result of being crushed by vehicles and disturbance of soil. During pedestrian surveys of the Action Area, desert tortoise sign (e.g., scat, tracks, burrows, shell fragments) as well as live tortoises were observed. In addition to the direct and indirect effects of construction on the tortoise, temporary and permanent disturbance to desert tortoise habitat would occur.

- Capturing, handling, and relocating desert tortoises out of the solar sites may result in harassment and possibly injury or death (Blythe et al. 2003). To minimize this effect, tortoises would be handled in accordance with USFWS handling protocols (Minimization Measures 4, 5, and 6).

- O&M activities along the gen-tie lines, site access roads, and within the solar sites could include direct mortality or injury as a result of being crushed by vehicles. Desert tortoises are expected to re-inhabit the solar sites during operations, the extent of which is unknown at this time. Minimization measures (**Section 2.6**) would be implemented to minimize this risk.

5.3 Moapa Dace

The Moapa dace is only known to occur in the Muddy River and several associated headwater springs in the Warm Springs area. These springs represent the primary water source for the Muddy River to which the Moapa dace is endemic. The Proposed Action would include water withdrawal of between 100 and 300 acre-feet per year (afy) for construction of each phase (each phase would be constructed separately over approximately 20 months, so the total withdrawal would stay at 100-300 afy during construction) and up to 30 afy for each phase for operation for up to 90 afy for operations. Groundwater withdrawals represent the only potential effect to Moapa dace from the Proposed Action.

5.3.1 Water Drawdowns

The entire flow of the Muddy River is derived from the discharge from the regional carbonate aquifer, except during infrequent precipitation events that increase River flows for up to a few days. Consumptive uses include 1) natural evapotranspiration, 2) surface-water diversions, and 3) groundwater diversions.

On July 14, 2005, a Memorandum of Agreement (MOA) was signed by the Southern Nevada Water Authority (SNWA), Meadow Valley Wash Water District (MVWWD), Coyote Springs Investments (CSI), Moapa Band and the USFWS regarding the withdrawal of 16,100 afy from the regional carbonate aquifer in Coyote Spring Valley and California Wash Basins that included conservation measures for the Moapa dace. The MOA outlined specific conservation actions that each party would complete in order to minimize potential impacts to the Moapa dace should water levels decline in the Muddy River system as a result of the cumulative withdrawal of 16,100 afy of groundwater from the two basins. On January 20, 2006, the USFWS concluded intra-service consultation and issued a programmatic biological opinion (PBO) entitled the *Intra-Service Programmatic Biological Opinion for the Proposed Muddy River Memorandum of Agreement Regarding the Groundwater Withdrawal of 16,100 Acre-Feet per Year from the Regional Carbonate Aquifer in Coyote Spring Valley and California Wash Basins, and Establish Conservation Measures for the Moapa Dace, Clark County, Nevada* (PBO).

The PBO indicated that the adverse effects associated with the withdrawal of 16,100 afy of groundwater would not result in "jeopardy" for the Moapa dace. Current monitoring data indicate that no instream flow trigger points have been reached (USFWS 2021b).

The Moapa dace would not be directly affected by the construction or O&M of the proposed action. However, groundwater withdrawals associated with the proposed action would indirectly affect the Moapa dace. The effects of these groundwater withdrawals were previously analyzed in the 2006 PBO which evaluated the cumulative effects associated with the withdrawal of up to 16,100 afy from the carbonate aquifer in Coyote Spring Valley and California Wash basins. The Tribe is one of several parties that would withdraw water under this analysis. Up to 2,500 afy of Tribal withdrawals were included for

the Tribe out of the total 16,100 analyzed in the 2006 PBO; the 100-300 afy (construction) and 90 afy (operations) of withdrawals proposed by the Projects would be included in the previously permitted 2,500 afy. The K-road Project has already been built and is permitted to use up to 40 afy during operations (BIA 2012); the Moapa Solar Energy Center has not been built and water allocations (100 AF for construction and up to 30 afy during operations, BIA 2014)) would not be used as that will now become part of the Arrow Canyon Solar Project (ACSP) which is in construction and is permitted to use 100-300 afy during construction and up to 30 afy during operations (BIA 2020b); the Eagle Shadow Mountain project is in construction and is permitted to use 200 afy during construction and up to 20 afy during operations (BIA 2020a); together, the Southern Bighorn I and II Solar Projects are permitted to use 400 afy during construction and 40 afy during operations (BIA 2021). Total water use from the Muddy River system for all these projects, combined with the Proposed Action (up to 900 afy), would be up to 1,800 afy during construction (which would not occur at the same time) and up to 220 afy during operations, under the allotted 2,500 afy for the Tribe. The use of the 100-300 afy for each phase of construction (which would occur at different times) and 30 afy for each Project during operations for a total of 90 afy would contribute to ongoing adverse effects to Moapa dace as was analyzed in the 2006 PBO to which this document tiers.

Determination

Groundwater pumping associated with the Proposed Action may affect, and is likely to adversely affect, Moapa dace because the withdrawal of water (100-300 afy for each of the three phases during construction and 90 afy [30afy for each of the three phases] during operations) could contribute to ongoing adverse effects as analyzed in the 2006 PBO.

5.4 Cumulative Effects

Cumulative effects are those effects from future private, state, or Tribal activities that are likely to occur within the Action Area. Future federal actions are excluded as these are subject to Section 7 consultation under the ESA (50 CFR 402.02). The Eagle Shadow Mountain Solar Project was recently approved and would be located on the Moapa River Indian Reservation (construction began in mid-2020). The Arrow Canyon Solar Project was recently approved and would be located on the Reservation (construction began mid-2021). The Southern Bighorn Solar II and Solar I Projects were approved concurrently and would be located on the Reservation. The Gemini Solar and Battery Storage Project was recently approved and would be located on BLM land southeast of the Reservation and southwest of the Chuckwalla Projects. Since the action areas are managed by BIA and BLM, Section 7 consultation would be required.

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Appendix A. USFWS IPaC Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Las Vegas, NV 89130-2301
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In Reply Refer To:
Consultation Code: 08ENVS00-2021-SLI-0229
Event Code: 08ENVS00-2021-E-00396
Project Name: Chuckwalla Solar Projects

September 23, 2021

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

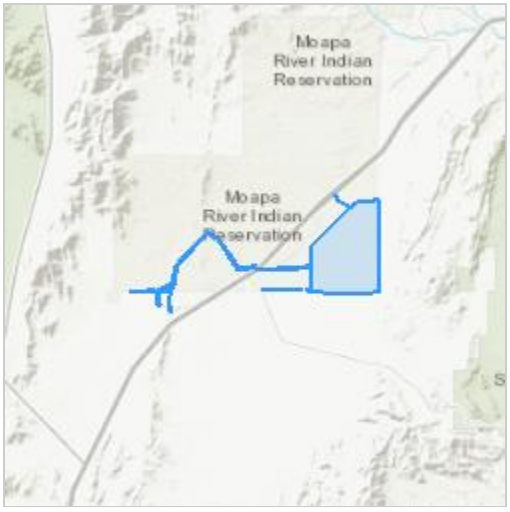
This species list is provided by:

Southern Nevada Fish And Wildlife Office
4701 N. Torrey Pines Drive
Las Vegas, NV 89130-2301
(702) 515-5230

Project Summary

Consultation Code: 08ENVS00-2021-SLI-0229
Event Code: Some(08ENVS00-2021-E-00396)
Project Name: Chuckwalla Solar Projects
Project Type: POWER GENERATION
Project Description: Proposed solar project.
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.51396020000004,-114.6846248032418,14z



Counties: Clark County, Nevada

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Yuma Ridgways (clapper) Rail *Rallus obsoletus [=longirostris] yumanensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3505	Endangered

Reptiles

NAME	STATUS
Desert Tortoise *Gopherus agassizii* Population: Wherever found, except AZ south and east of Colorado R., and Mexico There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4481	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bendire's Thrasher *Toxostoma bendirei* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9435	Breeds Mar 15 to Jul 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Dec 1 to Aug 31

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

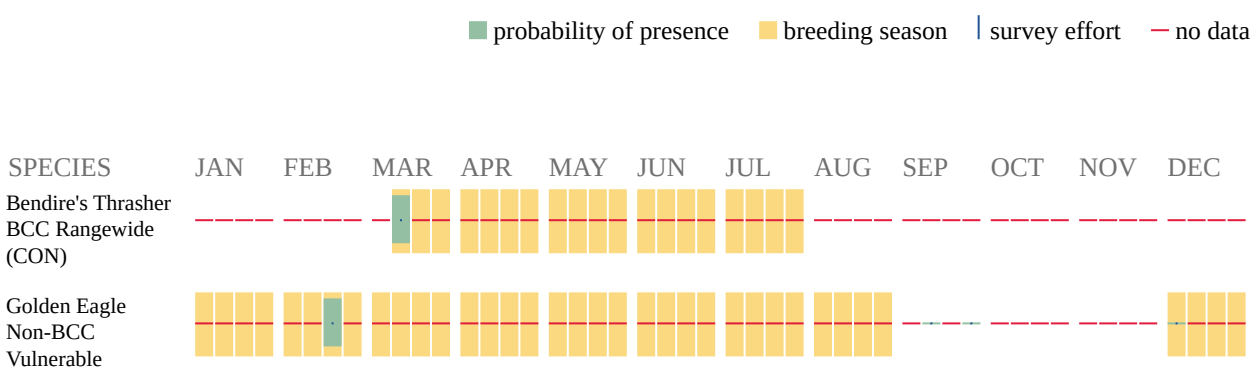
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as

occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can

implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER POND

- PUBF

RIVERINE

- R4SBC

Appendix N

Hydrology Study

Chuckwalla Solar Project
Preliminary Hydrology and Hydraulics Study Rev-1

October 2020
Revised July 2021

Prepared for:
EDF Renewables
15445 Innovation Drive
San Diego, CA 92128

Prepared by:
NV5
15092 Avenue of Science, Suite 200
San Diego, CA 92128

TABLE OF CONTENTS

1.0 INTRODUCTION

The Chuckwalla Solar Project, located within Clark County, is approximately 35 miles northeast of the city of Las Vegas, Nevada, just east of Interstate 15 (I-15). The project area is anticipated to be developed with solar photovoltaic (PV) modules and other associated infrastructure (e.g., access roads and gen-tie lines). NV5, Inc. (NV5) has been retained by EDF Renewable Development, Inc. (EDF) to conduct preliminary hydrologic and hydraulic analyses for the areas tributary to and encompassing this project area. The following sections discuss in further detail the methodology, assumptions, and results for these analyses.

1.1 Purpose and Scope

The analyses criteria presented within this study were developed based on direction from EDF in order to understand general hydrologic, hydraulic, and scour conditions within the project boundary. These analyses are preliminary in nature and do not support final design efforts associated with development of the project.

Specifically, this study includes:

- Hydrologic calculations to determine the 100-year inflow hydrographs which may affect the project site. Calculations will follow methodology prescribed by the Clark County Regional Flood Control District (CCRFCD).
- Hydraulic calculations (e.g., maximum flow depth and velocity) through the study area for the 100-year design storm event.
- Preliminary scour estimate assuming 100-year design storm conditions.

1.2 Study Area

As previously mentioned, the project is within Clark County, Nevada, approximately one mile east of I-15, between the city of Las Vegas and the unincorporated town of Moapa, Nevada (Figure 1). More specifically, it is located within the Mojave Desert, at the western base of the North Muddy Mountains and just outside the California Wash, which flows adjacent to its western border.

The project area is primarily located on an alluvial fan such that a majority of runoff which travels through the site originates from the North Muddy Mountains. Due to the potential impact to the project site from ephemeral flows in the California Wash, tributary flows were calculated for this flooding source for hydraulic modeling purposes.

The Mojave Desert is considered the ‘high desert’ as elevations are generally above 2,000 feet. As such, rainfall is typically minimal, supporting drought tolerant flora, such as various cactus and yucca species, creosotebush, sagebrush, and blackbrush, among many others. As indicated by the Natural Resources Conservation Service (NRCS), soils within the tributary watershed range from rock formations in the North Muddy Mountains, to sandy loams in the alluvial plain area. Section 2.0 of the report discusses the correlation between vegetation and soil to the hydrologic calculations.

The proposed project is located within unshaded Zone X and potentially Zone A special flood hazard areas (SFHA) as defined by FEMA Flood Insurance Rate Map (FIRM) 32003C1075E and 32003C1475E (effective date of 9/27/2002). An unshaded Zone X is defined as an area outside of the 0.2% (500-year) annual chance floodplain and a Zone A is a 100-year approximate floodplain (no base flood elevations determined).

2.0 HYDROLOGY

2.1 Methodology

Hydrologic calculations were performed in accordance with the CCRFCD Hydrologic Criteria and Drainage Design Manual (District Manual), adopted on August 12, 1999. Per Section 601 of the District Manual, four deterministic hydrologic models can be used to calculate runoff generated from design storm events: 1. Rational Formula method, 2. SCS TR-55 method, 3. SCS Unit Hydrograph method, and 4. Kinematic Wave method. However, per Section 304.3 of the District Manual, only the SCS Unit Hydrograph or Kinematic Wave method may be used for drainage areas greater than 150 acres. Because the tributary area which concerns this project is approximately 13.5 square miles and greatly exceeds this threshold, the SCS Unit Hydrograph methodology was used for this analysis.

The United States Army Corps of Engineers HEC-HMS software (version 4.3, dated November 2018) was used to perform hydrologic calculations for this project. This software represents the windows based version of HEC-1, which the District Manual recommends for performing SCS Unit Hydrograph calculations.

The Unit Hydrograph method transforms excess precipitation to runoff hydrographs through a convolution process. The lagged hydrographs are developed from the Soil Conservation Service (SCS, now NRCS) synthetic unit hydrograph. Subarea lag time is needed for this calculation and is defined in the District Manual, Section 606.3, as follows:

$$\text{Lag (hours)} = 20K_n((L \times L_c)/(s^{0.5}))^{0.33}$$

K_n	=	Estimated roughness of all streams and channels
L	=	Length of longest watercourse (miles)
L_c	=	Length along longest watercourse, measured upstream to a point opposite the centroid of area (miles)
s	=	Slope of longest watercourse (feet/mile)

- The SCS (NRCS) Dimensionless Unit Hydrograph was specified to transform excess precipitation into runoff. The standard peaking factor of 484 was applied to determine the ultimate peak discharge value.
- NOAA rainfall values (see Section 2.2) were selected for the 6-hour storm duration.
- Depth-area factors are provided in Figure 514 of the District Manual, however, for the purposes of this study, they were not used. Because a majority of the subareas are less than one square-mile, the adjustments would be minimal.

- Manning's basin friction factor was estimated to be 0.04 using Table 604 in the District Manual. This represents an average of the natural area watercourses featuring both well-defined and more braided flow conditions.
- NRCS data was utilized to determine soil types in the tributary watershed. In general, this resulted in Type D soils in the North Muddy Mountains and Type A in the alluvial plain areas.
- Runoff curve numbers (CN) were specified based on cover type, hydrologic condition, and soil type, following Table 602 in the District Manual.
- Impervious areas with the watershed appear to be non-existent based on review of aerial imagery.
- Base flow was assumed to be zero.

2.2 Precipitation Data

Precipitation data published in the National Weather Service NOAA Atlas 14, Volume 1, Version 5.0 for the Semiarid Southwest, which includes Nevada, was used for this study. This document was released in 2006 and updated in 2011. It supersedes precipitation-frequency estimates found in NOAA Atlas 2, published in 1973. NOAA Atlas 2 data is specified by the District Manual to be used in conjunction with scalar coefficients. These scalars are required by the District Manual for storm durations of six hours or less in order to adjust the NOAA Atlas 2 precipitation data to reflect more recent data pertaining to Clark County. Because the District Manual was published in 1999, the NOAA Atlas 14 data was not available. Therefore, for the purposes of this study the NOAA Atlas 14 data was assumed to account for more recent precipitation patterns and was not further adjusted using the aforementioned scaling factors.

As recommended in Section 504.1 of the District Manual, a 6-hour storm event should be used for all HEC-1 (HEC-HMS) modeling in Clark County. As such, the 100-year, 6-hour precipitation values were obtained from NOAA Atlas 14. The GIS ArcMap, Version 10.4.1 program was used to obtain subarea precipitation averages for this design storm event. These values were calculated by averaging the NOAA raster precipitation that fell within each subarea. Table 1 lists the precipitation values for the 100-year event.

Lastly, per Section 504.2 of the District Manual, the 6-hour precipitation is to be distributed based on drainage area size. For drainage areas less than 8 square miles and greater than 12 square miles, SDN 3 and SDN 5 distribution are to be applied, respectively (Table 503 in the District Manual). As they relate to this study, subareas TAV01 through TAV04 and TAV05 through TAV12 utilized SDN 5 and SDN 3, respectively. These distributions and their application to the point precipitation values (Table 1) can be found in Appendix A.

Table 1: 100-year Precipitation Depths Summary

Subarea	6-hour (in)
TAV01	2.119
TAV02	2.121
TAV03	2.240
TAV04	2.194
TAV05	2.149
TAV06	2.148
TAV07	2.148
TAV08	2.144
TAV09	2.129
TAV10	2.128
TAV11	2.120
TAV12	2.121

2.3 Hydrologic Soil Type and Cover

The NRCS web soil survey was used to determine the soil types within the studied watershed. Soils are classified into hydrologic soils groups (HSGs) to indicate the minimum rate of infiltration obtained for bare soil after prolonged wetting. The HSGs, which are Types A, B, C, and D, are one element used in determining runoff curve numbers. Type D soils were assumed in the rocky North Muddy Mountains and with Type A/B soils predominate in the alluvial plain areas. Table 2 describes the HSG properties.

Based on aerial imagery and general knowledge of the Mojave Desert region, the 'Desert Shrub' classification was chosen, which includes vegetation such as saltbush, creosote bush, blackbrush, and cactus. This cover is generally indicative of the entire tributary watershed. A 'fair' hydrologic condition was also selected which represents ground cover of approximately 30 to 70 percent. Finally, the curve numbers (CN) were selected assuming an Antecedent Moisture Condition (AMC) II, per section 603.2.1 of the District Manual.

From Table 602 in the District Manual, which is a replication of the SCS (NRCS) TR-55 CN table (June 1986), the following CN values were specified:

- Type A: CN = 55
- Type B: CN = 72
- Type C: CN = 81
- Type D: CN = 86

Weighted curve number calculations were performed based upon land use and soil type, resulting in values ranging from approximately 65 in the more alluvial plain subareas (e.g., TAV09) to approximately 85 in areas where rockland formation was predominate (e.g., TAV01).

Table 2 Hydrologic Soil Group Description

HSG Type	Description
A	Low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sand or gravel and have a high rate of water transmission.
B	Moderate infiltration rates when thoroughly wetted and consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately course textures.
C	Low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water and soils with moderately fine to fine texture.
D	High runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with high swelling potential, soils with permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material.

2.4 Basin Delineation

The basin delineation was based on United States Geological Survey (USGS) 1/3 arc-second (10-meter) topography, referenced to horizontal datum NAD83 and vertical datum NAVD88. This watershed delineation resulted in twelve subareas, referenced as TAV01 through TAV12 (see Figure 2).

Subareas range in size from approximately 0.3 square miles (TAV06) to just over 95 square miles (TAV03). The largest subarea, TAV06, contributed a significant amount of flow to the California Wash. Subareas TAV04 through TAV12 drain westerly and are the primarily direct contributors of runoff through the project site.

Lastly, it is anticipated that should a final study be prepared for this project and/or project details are modified, additional subarea delineation and hydrologic details are recommended.

2.5 Hydrologic Results

The peak flow results of the 100-year, 6-hour storm event for the eleven subareas are summarized in Table 3, on the following page. The complete hydrograph results can be found in Appendix A.

Table 3: 100-year, 6-hour Hydrologic Analyses Results

Watershed Subarea	Tributary Area (mi^2)	Peak Flow Rate (cfs)
TAV01	19.12	3,125.2
TAV02	13.24	3,001.6
TAV03	95.10	11,085.8
TAV04	40.39	5,202.7
TAV05	3.56	426.6
TAV06	0.34	83.8
TAV07	4.57	360.0
TAV08	2.69	281.0
TAV09	1.50	81.6
TAV10	1.56	70.8
TAV11	3.12	165.9
TAV12	2.12	154.8

Regression equations published by the USGS are available for southeastern Nevada (Region 10). This region regresses 104 stations to develop peak discharge equations, including the 100-year storm event. The Region 10 equation is applicable to drainage areas up to 1,000 square-miles, but should be limited to 200 square-miles. The 100-year equation is as follows:

$$Q_{100} = 850DA^{0.69}$$

Where:

Q_{100} = Peak 100-year discharge (cfs)
DA = Tributary drainage area (square-miles)

When looking at the smallest subarea (TAV06) and largest subarea (TAV03), application of this equation results in peak discharge rates of 406 cfs and 19,695 cfs, respectively. Compared to the HEC-HMS results shown in Table 3, these values represent increases of approximately 485 percent for TAV06 and 177 percent for TAV03. Although there are differences between the two results, an 'order-of-magnitude' level of validation exists that is appropriate for this study. Additionally, deviations from regional regression equations are typically expected, so the results should generally be considered for informational purposes.

3.0 HYDRAULICS

A two-dimensional model, FLO-2D (version 20.07.22), was used to calculate the desired hydraulic results (e.g., flow depths and velocity values) for the areas of concern. The following sections discuss the input data pertinent to the hydraulic computations.

3.1 Terrain Data

The surface for the FLO-2D model was created from a ten-meter digital elevation model (DEM) developed by the USGS. This topography is referenced vertically to the North American Vertical Datum of 1988 (NAVD88) and horizontally to the North American Datum of 1983 (NAD83).

Within FLO-2D, a grid system is set up and each cell is assigned an elevation through interpolation of the imported surface data. This was performed by FLO-2D's average resampling algorithm for each of the 50-foot grid cells.

The land use is generally homogeneous throughout the study area. Based on aerial photography, the surface category was selected as barren with sparse cover density. Using the FLO-2D PRO Reference Manual and USGS references as a guide, a value of 0.03 was selected as the deterministic surface roughness.

3.2 Boundary Conditions

Upstream boundary conditions were defined using inflow hydrographs corresponding to the hydrologic results from the 12 subareas. Downstream boundary conditions were assumed as normal depth and were placed significantly outside of the project area to mitigate any upstream propagation from this assumption.

3.3 Hydraulic Results

As seen in Figure 3 and Figure 4, runoff from subareas TAV04 through TAV12, which most directly impact the project site, results in 100-year depths and velocities of approximately 0.5 feet and 1.5 feet-per-second (fps), respectively. Higher depths and velocities are present in a portion of the western side of the site and within the California Wash.

Although these results do not indicate significant channelization, the base topography, combined with a 50-foot, may effectively mute fine surface details. Therefore, areas of concentrated flow may be present in subsequent studies assuming an increase in topographic and model precision.

4.0 SCOUR ANALYSES

Potential scour during a 100-year design storm was calculated at the PV module locations. These calculations should be considered approximate as they take only a cursory look at the components anticipated to contribute to potential scour, namely general, local, and bedform scour.

General scour is the component of scour resulting from the 100-year discharge imparting shear stress on the bed across the site and removing sediment. The sediment transport component of FLO-2D was used to estimate this value. Based on the various parameters for which these empirical equations were developed, such as bed slope, median particle size, and velocity, the Zeller-Fullerton equation was specified.

A geotechnical investigation has not been performed for this project, therefore, data from the nearby Arrow Canyon solar project was used. From that project's geotechnical report, surficial soils were classified mainly as sands and gravels. After parsing out borings taken at depths greater than 4 feet, the average median particle size was calculated to be 1.03 mm (medium sand). The accompanying average D_{16} and D_{84} resulted in a gradation coefficient of 8.14.

Model boundary parameters remained consistent with the clear-water calculations (see Section 3.0), with the exception of the inflow node associated with TAV02. In this location, a rigid bed was specified and the inflow sediment supply was set to zero. This allows FLO-2D to generate an equilibrium (transport potential equal to capacity) inflow sediment load based upon the selected transport equation.

As seen in Figure 5, scour through a majority of the project site was approximately 0.1 feet, however, there are some concentrated flow areas near the western side of the site where larger scour depths were calculated. Because we have used the sediment transport results to understand general site trends over a predominately sheet flow environment, this 0.1 foot value was deemed appropriate for the general scour component outside of the concentrated flow areas.

Local scour at the PV module supports is akin to pier scour for bridges. Both the CSU and FDOT equations were evaluated assuming depth and velocities of 0.5 feet and 1.5 fps, respectively. Assuming a W6x9 pile with width of approximately 0.5 feet, the CSU and FDOT equations resulted in 100-year scour depths of approximately 0.7 feet and 1.0 feet, respectively. The more conservative value of 1.0 feet was selected for the purposes of this study.

Dune bedforms were also assumed given the hydraulic results and soil composition, resulting in a scour depth of approximately 0.1 feet.

When the above scour components are summed, the resulting total 100-year scour depth is approximately 1.2 feet. It is recommended that at a minimum, a safety factor of 1.5 is used due to various uncertainties regarding the topographic data, geotechnical information, and modeling details, resulting in a depth of approximately 1.8 feet.

This value represents an approximate scour depth that can be expected within a majority of the project area, but it is not intended for design purposes. It assumes that PV modules will be constructed outside of concentrated flow paths. Furthermore, it should be recognized that avulsion analyses have not been performed at this design stage, which may change the presented depth and velocity results.

5.0 SUMMARY

NV5 was retained by EDF to conduct hydrologic and hydraulic analyses for the areas tributary to and encompassing the Chuckwalla Solar Project. Hydrologic calculations were performed in accordance with Clark County Regional Flood Control District standards to develop 100-year hydrographs.

Given the distributary conditions of the project location, FLO-2D, a two-dimensional hydraulic model was implemented to characterize depths and velocities within the project area. The 100-year, 6-hour storm results indicated that outside of concentrated flow paths, depths and velocities generally less than 0.5 feet and 1.5 fps, respectively, could be expected.

Lastly, the preliminary 100-year scour depths outside of concentrated flow paths and other high velocity areas is currently estimated to be approximately 1.8 feet and should be considered preliminary and assumes construction outside of the existing concentrated flow paths. This value is also not reflective of any avulsion analyses, project geotechnical report, proposed improvements, or other impacts based on the results of future work.

6.0 REFERENCES

1. Barr Engineering Co. *Geotechnical Engineering Report: Arrow Canyon Solar Project, Final (Rev. 1)*, March 2020.

2. Clark County Regional Flood Control District. *Hydrologic Criteria and Drainage Design Manual,* Adopted August 12, 1999.

3. FLO-2D Software, Inc., *FLO-2D Data Input Manual, Nutrioso, AZ.* 2014.

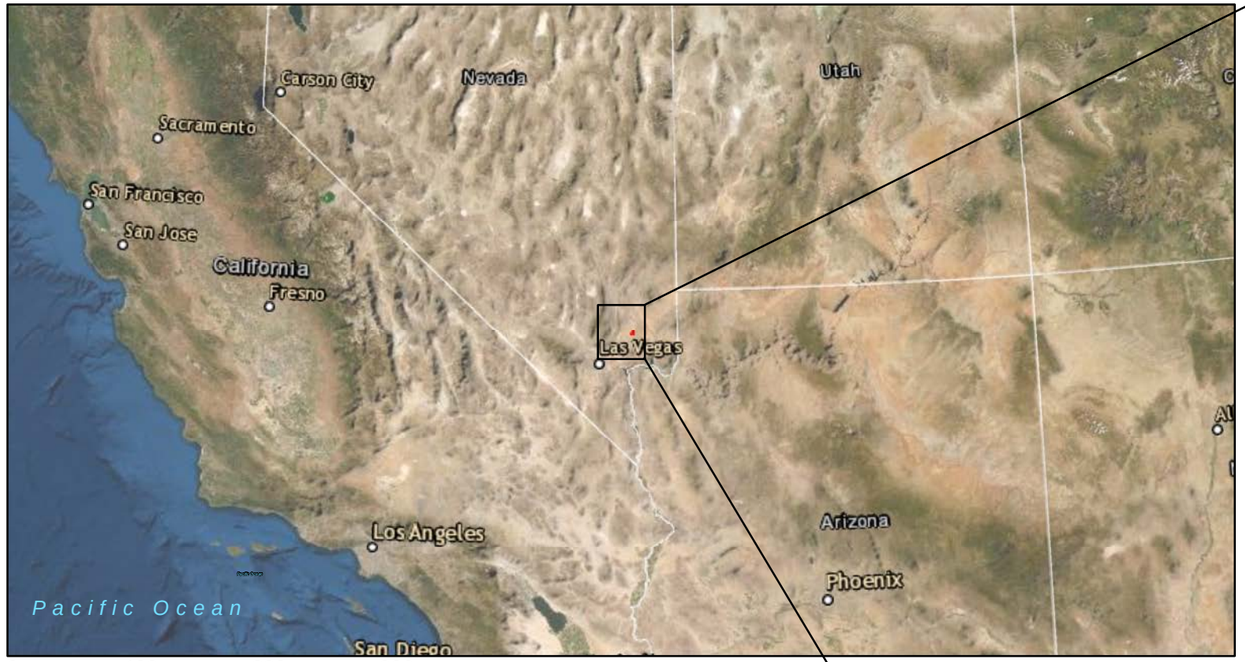
4. FLO-2D Software, Inc., *FLO-2D PRO Reference Manual, Nutrioso, AZ.* 2012.

5. United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey. *Virgin River Area, Nevada and Arizona.* Version 17, August 26, 2020.

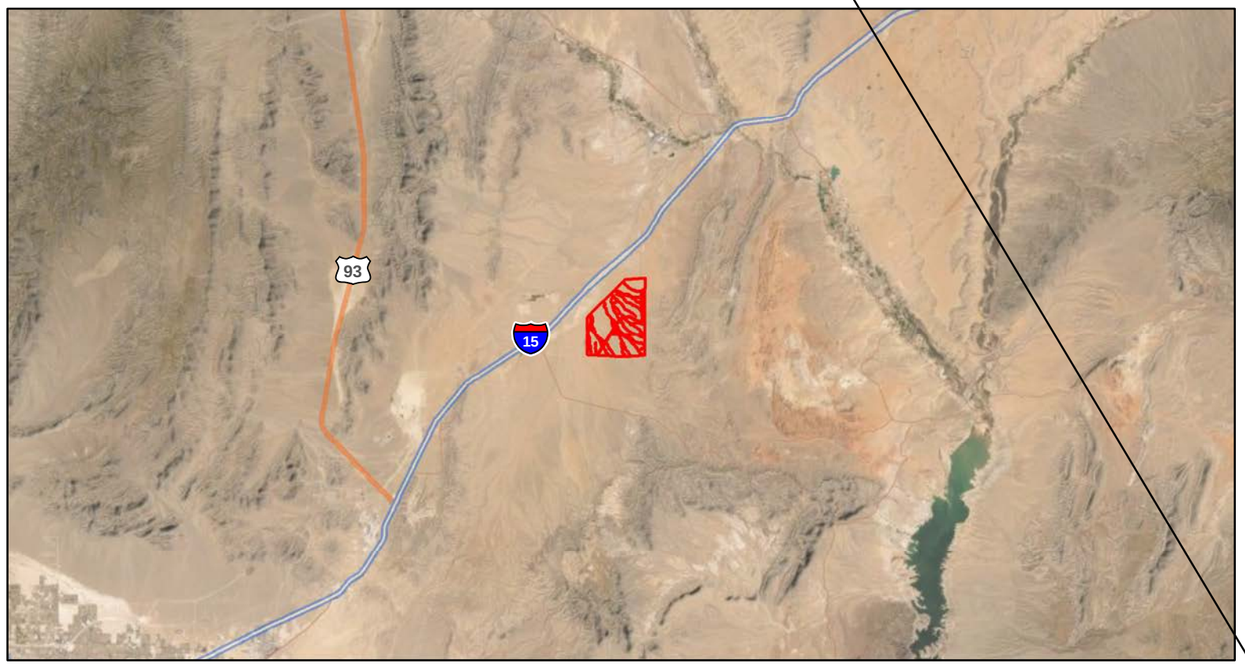
6. United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) National Watershed Boundary Dataset. *Clark County, Nevada.* 2018.

7. United States Department of Transportation Federal Highway Administration (FHWA). *Evaluating Scour at Bridges Fifth Edition.* April 2012.

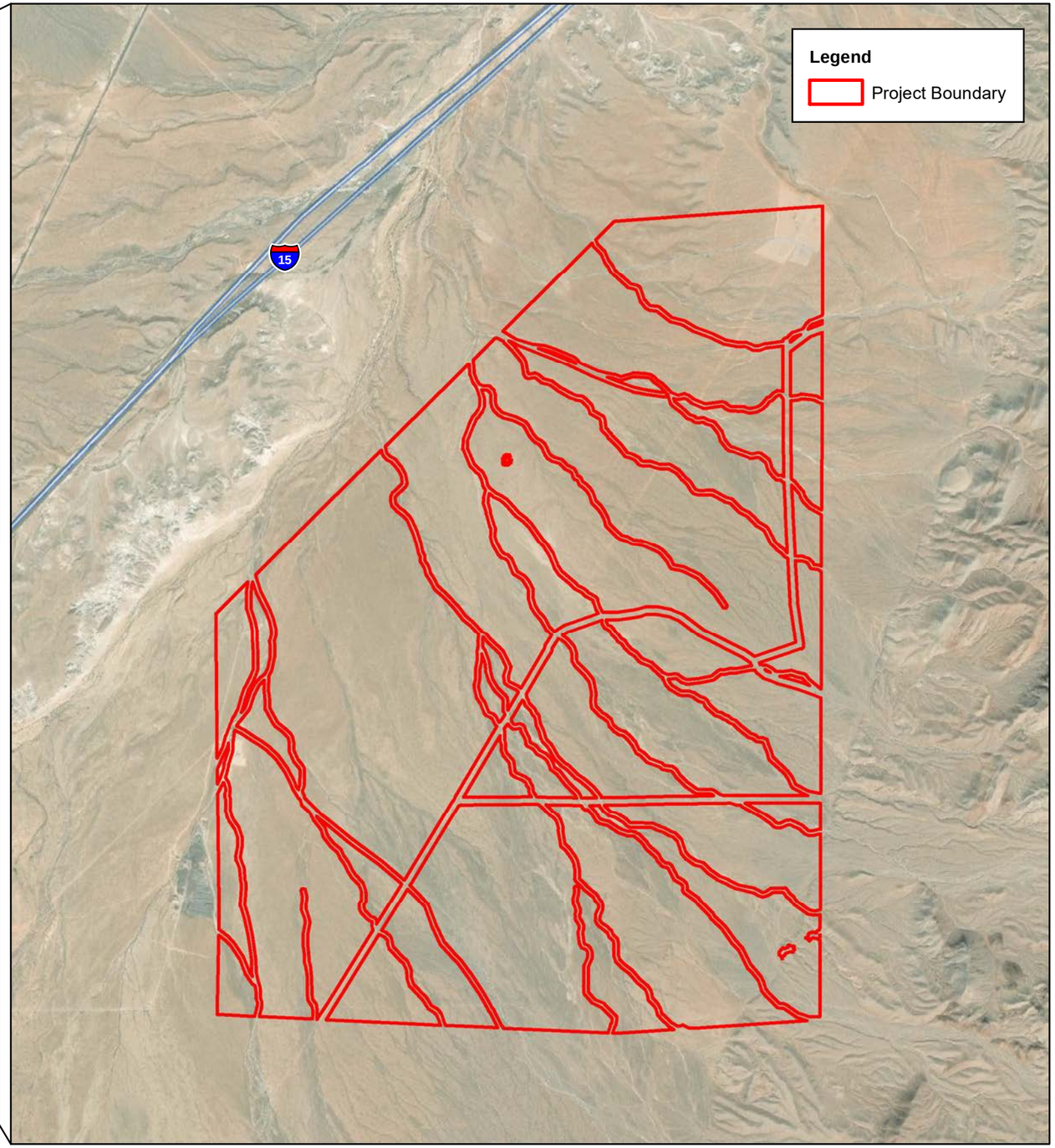
8. United States Geological Survey (USGS) National Flood-Frequency Program. *Methods for Estimating Flood Magnitude and Frequency in Rural Areas in Nevada.* 1999.



0 100 200 300 Miles



0 5 10 15 20 Miles



0 0.25 0.5 0.75 1 Mile

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Figure 1: Vicinity Map

N W E S

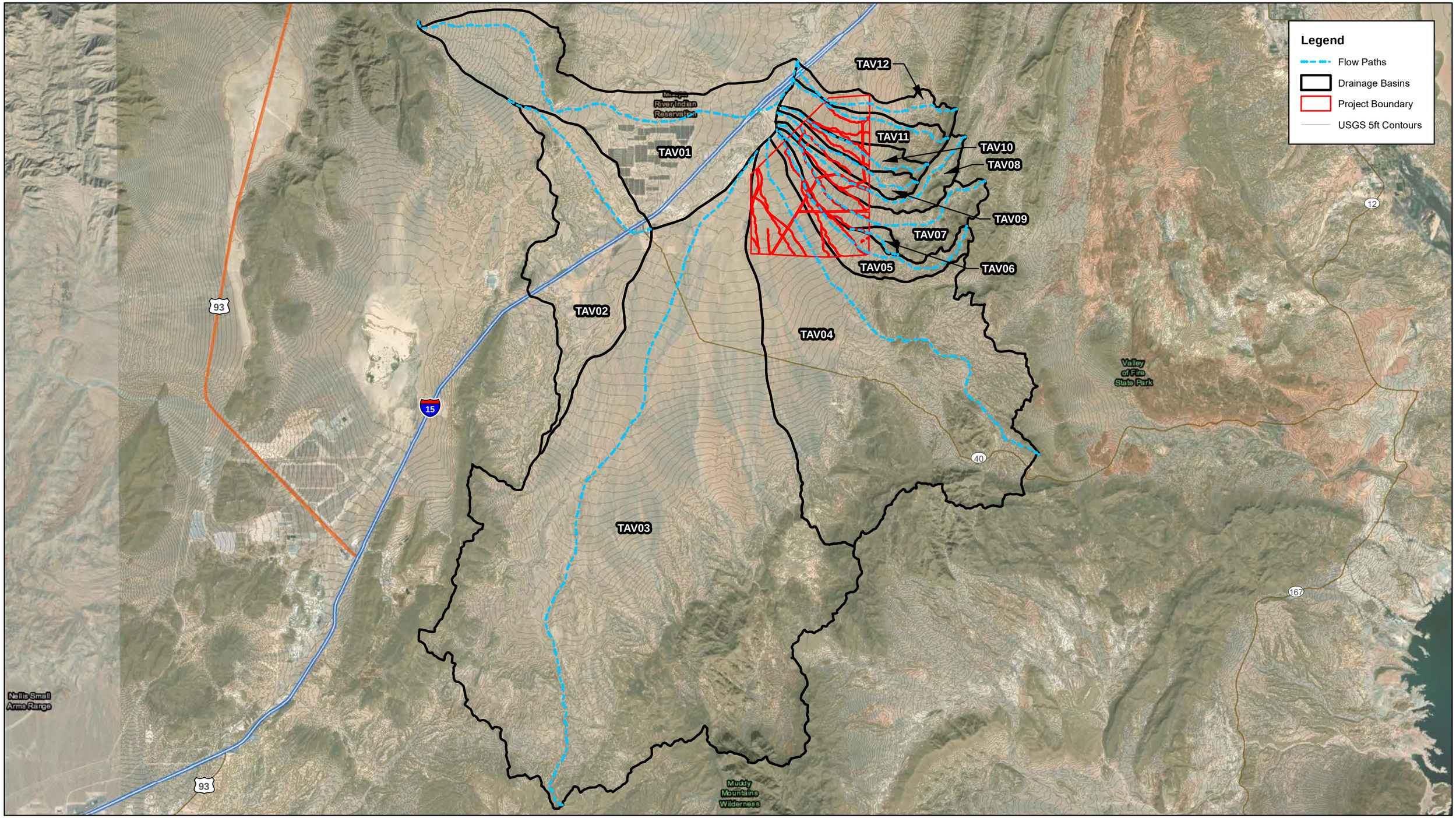

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Figure 2: Hydrology Workmap

1 inch = 2 miles

N W E S

0 2 4 6 8 Miles

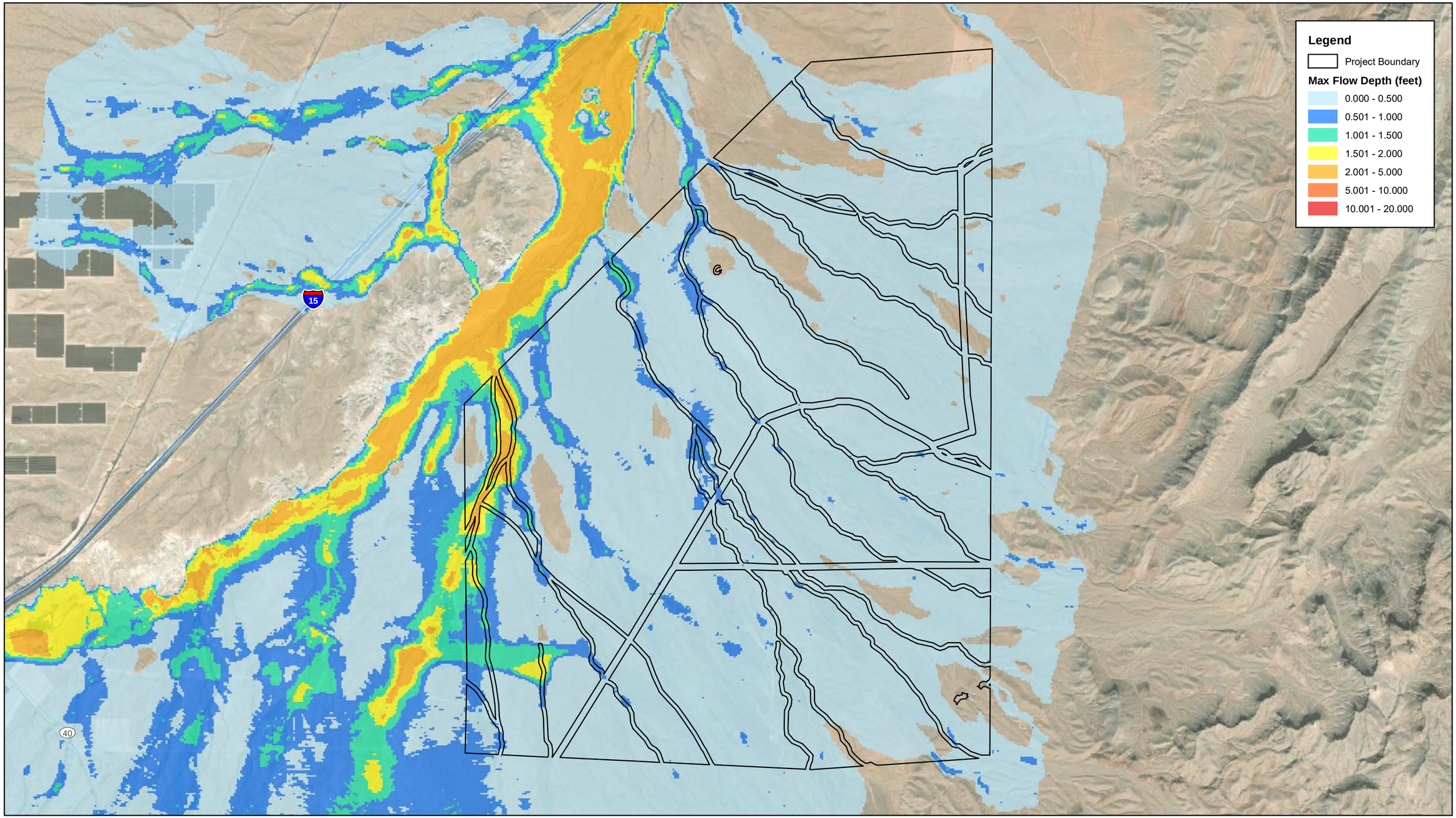

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Figure 3: 100-Year Depth Map

N
W E
S

0 0.45 0.9 1.35 1.8 Miles

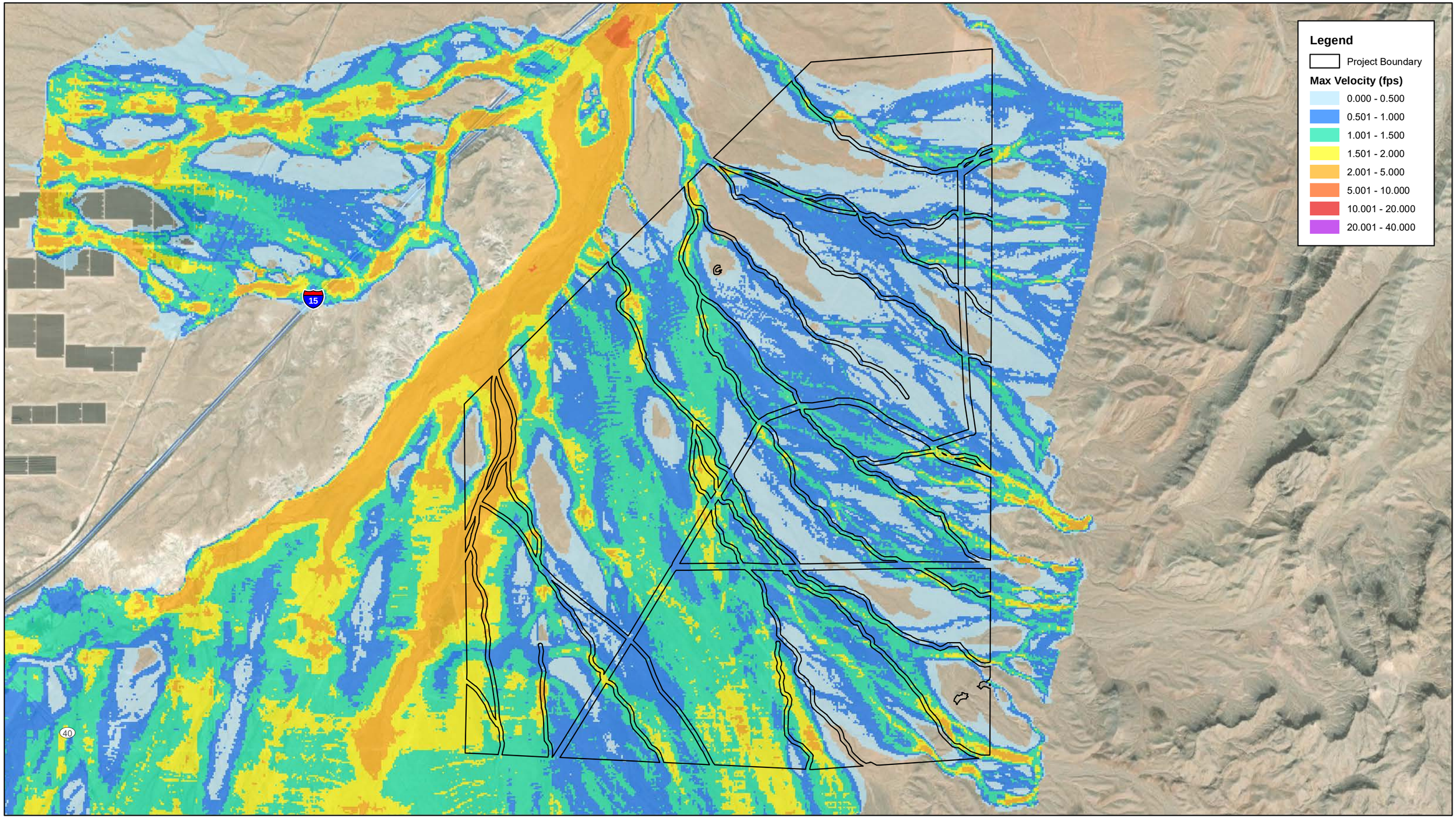

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Figure 4: 100-Year Velocity Map

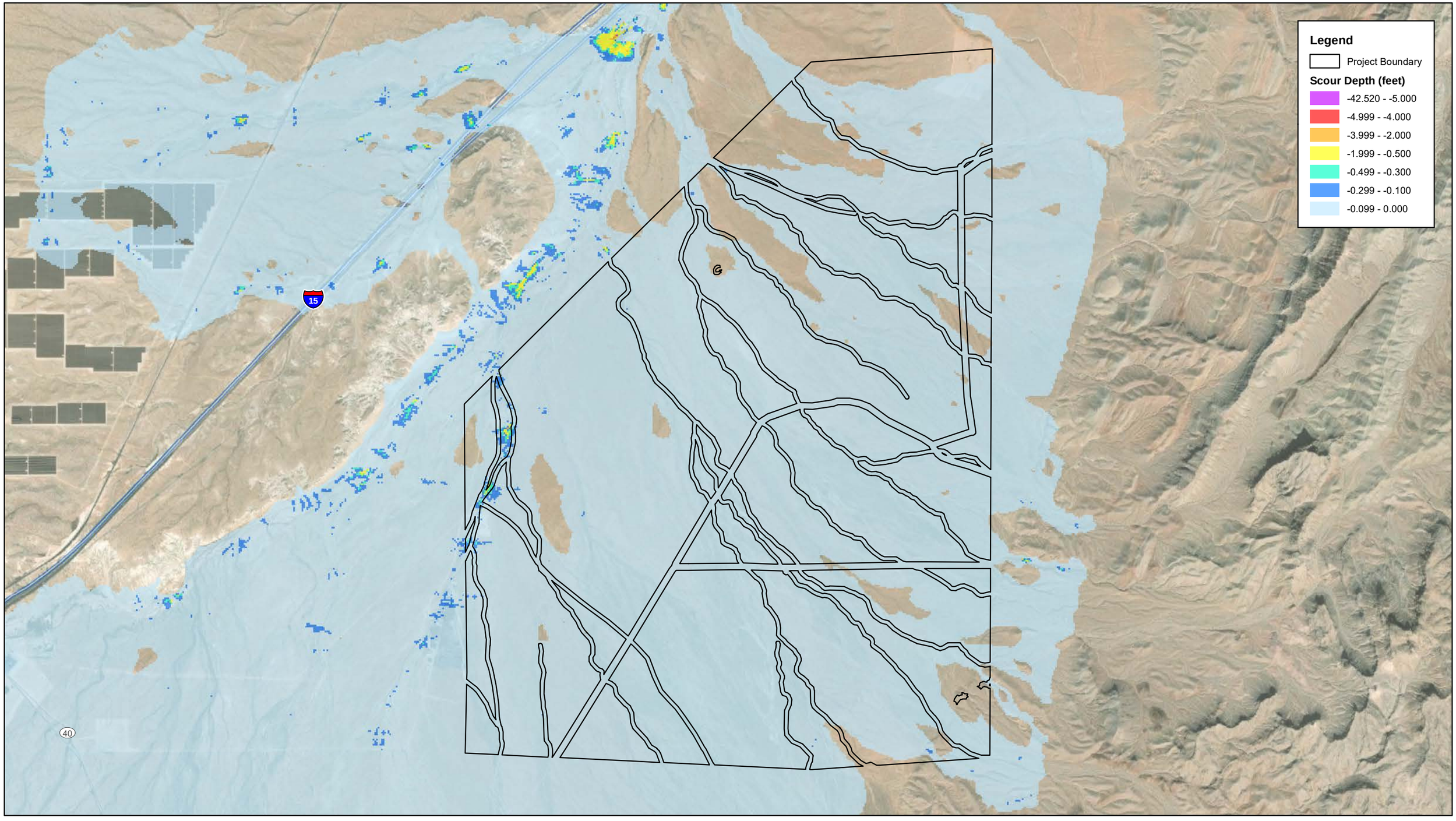

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Figure 5: 100-Year General Scour Map

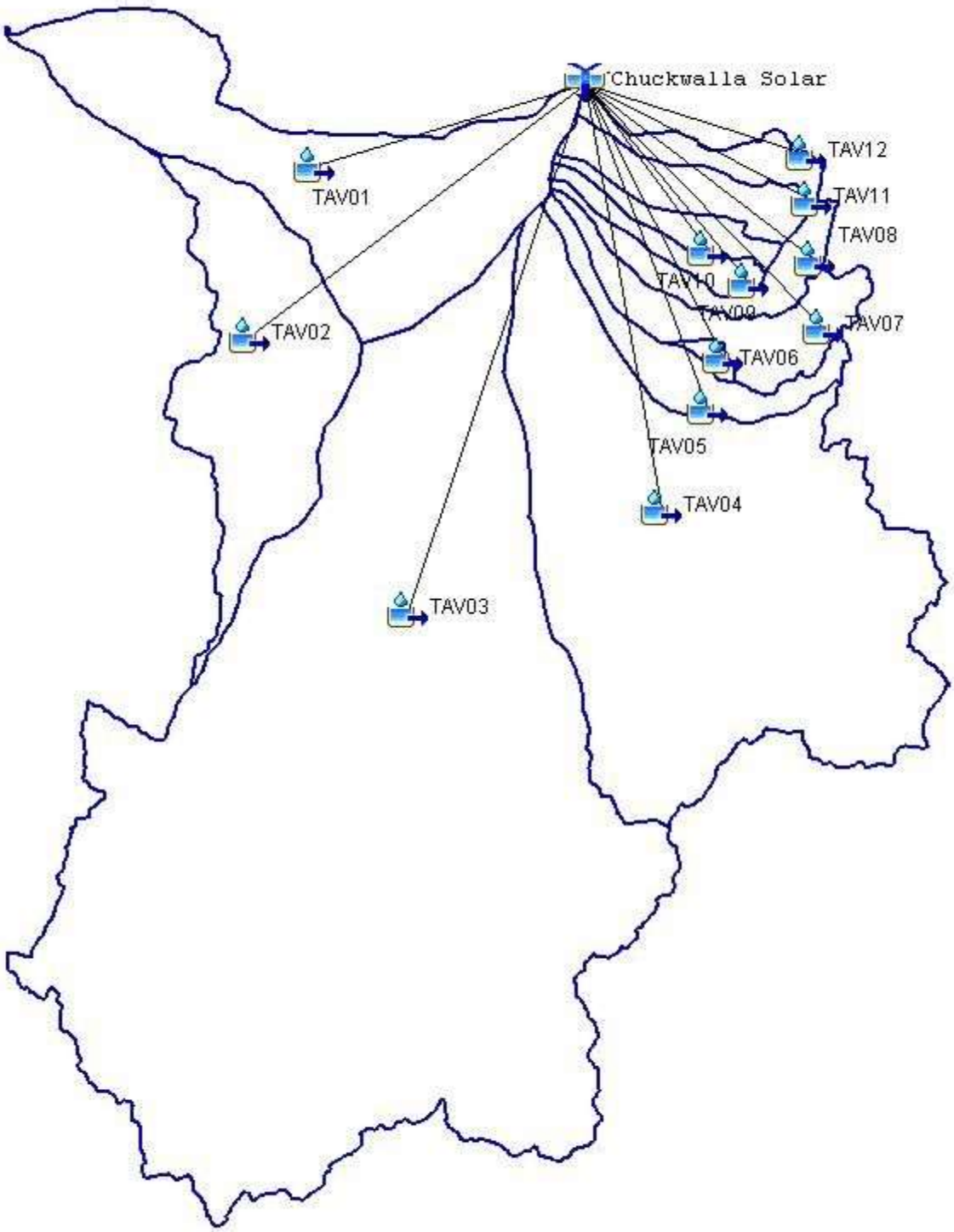
1 inch = 1 mile

N W E S

0 0.45 0.9 1.35 1.8 Miles

APPENDIX A: HEC-HMS Input and Output

HEC-HMS Schematic
Precipitation
Lag Calculations
Routing Parameters
NRCS Soils Information
Output Hydrographs


Chuckwalla Solar
TAV12
TAV11
TAV08
TAV10
TAV09
TAV07
TAV06
TAV05
TAV04
TAV03
TAV02
TAV01

HEC-HMS Subarea Input

Subarea	Area (ft^2)	Area (mi^2)	"n" value	L (ft)	L_c (ft)	L (miles)	L_c (miles)	$Elev_1$ (ft)	$Elev_2$ (ft)	$Elev_{(1-2)}$ (ft)	S_1 (ft/mile)	Corps T_1 (hrs)	Corps T_1 (min)
TAV01	533158881.8	19.12	0.040	64788.2	21936.7	12.27	4.15	971.0	556.0	415	33.82	1.64	98.26
TAV02	369020763.5	13.24	0.040	27663.4	7487.6	5.24	1.42	715.0	610.0	105	20.04	0.95	56.73
TAV03	2651262923.9	95.10	0.040	98563.4	44977.0	18.67	8.52	1040.0	577.0	463	24.80	2.51	150.53
TAV04	1126047738.6	40.39	0.040	63184.9	31797.0	11.97	6.02	1125.0	574.0	551	46.04	1.74	104.68
TAV05	99189171.8	3.56	0.040	38687.9	17976.7	7.33	3.40	980.0	570.0	410	55.96	1.19	71.43
TAV06	9552184.86	0.34	0.040	7942.6	4728.4	1.50	0.90	740.0	634.0	106	70.47	0.44	26.24
TAV07	127473042.5	4.57	0.040	36885.3	23413.3	6.99	4.43	870.0	570.0	300	42.94	1.34	80.14
TAV08	74889059.1	2.69	0.040	33325.6	18826.2	6.31	3.57	810.0	570.0	240	38.02	1.23	73.58
TAV09	41790838.7	1.50	0.040	23009.3	12165.8	4.36	2.30	800.0	570.0	230	52.78	0.89	53.41
TAV10	43514045.6	1.56	0.040	23463.0	12170.4	4.44	2.30	780.0	570.0	210	47.26	0.91	54.75
TAV11	87087655.3	3.12	0.040	23779.5	11236.4	4.50	2.13	905.0	559.0	346	76.83	0.82	49.44
TAV12	59172804.4	2.12	0.040	25403.1	13659.1	4.81	2.59	840.0	556.0	284	59.03	0.94	56.28

HEC-HMS Design Storm Precipitation

Time (min)	Time (hrs)	SDN 3 (DA<8mi^2)	SDN 5 (DA>12mi^2)	100-Year, 6-Hour											
				TAV01	TAV02	TAV03	TAV04	TAV05	TAV06	TAV07	TAV08	TAV09	TAV10	TAV11	TAV12
				2.119	2.121	2.240	2.194	2.149	2.148	2.148	2.144	2.129	2.128	2.120	2.121
0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	0.083	0.020	0.020	0.042	0.042	0.045	0.044	0.043	0.043	0.043	0.043	0.043	0.043	0.042	0.042
10	0.167	0.057	0.059	0.125	0.125	0.132	0.129	0.122	0.122	0.122	0.122	0.121	0.121	0.121	0.121
15	0.250	0.070	0.080	0.170	0.170	0.179	0.176	0.150	0.150	0.150	0.150	0.149	0.149	0.148	0.148
20	0.333	0.087	0.110	0.233	0.233	0.246	0.241	0.187	0.187	0.187	0.187	0.185	0.185	0.184	0.185
25	0.417	0.108	0.144	0.305	0.305	0.323	0.316	0.232	0.232	0.232	0.232	0.230	0.230	0.229	0.229
30	0.500	0.124	0.150	0.318	0.318	0.336	0.329	0.266	0.266	0.266	0.266	0.264	0.264	0.263	0.263
35	0.583	0.130	0.160	0.339	0.339	0.358	0.351	0.279	0.279	0.279	0.279	0.277	0.277	0.276	0.276
40	0.667	0.130	0.168	0.356	0.356	0.376	0.369	0.279	0.279	0.279	0.279	0.277	0.277	0.276	0.276
45	0.750	0.130	0.171	0.362	0.363	0.383	0.375	0.279	0.279	0.279	0.279	0.277	0.277	0.276	0.276
50	0.833	0.130	0.180	0.381	0.382	0.403	0.395	0.279	0.279	0.279	0.279	0.277	0.277	0.276	0.276
55	0.917	0.130	0.182	0.386	0.386	0.408	0.399	0.279	0.279	0.279	0.279	0.277	0.277	0.276	0.276
60	1.000	0.130	0.187	0.396	0.397	0.419	0.410	0.279	0.279	0.279	0.279	0.277	0.277	0.276	0.276
65	1.083	0.133	0.190	0.403	0.403	0.426	0.417	0.286	0.286	0.286	0.285	0.283	0.283	0.282	0.282
70	1.167	0.140	0.197	0.417	0.418	0.441	0.432	0.301	0.301	0.301	0.300	0.298	0.298	0.297	0.297
75	1.250	0.142	0.202	0.428	0.428	0.452	0.443	0.305	0.305	0.305	0.304	0.302	0.302	0.301	0.301
80	1.333	0.148	0.210	0.445	0.445	0.470	0.461	0.318	0.318	0.318	0.317	0.315	0.315	0.314	0.314
85	1.417	0.158	0.220	0.466	0.467	0.493	0.483	0.340	0.339	0.339	0.339	0.336	0.336	0.335	0.335
90	1.500	0.172	0.230	0.487	0.488	0.515	0.505	0.370	0.369	0.369	0.369	0.366	0.366	0.365	0.365
95	1.583	0.181	0.241	0.511	0.511	0.540	0.529	0.389	0.389	0.389	0.388	0.385	0.385	0.384	0.384
100	1.667	0.190	0.250	0.530	0.530	0.560	0.549	0.408	0.408	0.408	0.407	0.405	0.404	0.403	0.403
105	1.750	0.197	0.259	0.549	0.549	0.580	0.568	0.423	0.423	0.423	0.422	0.419	0.419	0.418	0.418
110	1.833	0.199	0.265	0.562	0.562	0.594	0.581	0.428	0.427	0.427	0.427	0.424	0.423	0.422	0.422
115	1.917	0.200	0.280	0.593	0.594	0.627	0.614	0.430	0.430	0.430	0.429	0.426	0.426	0.424	0.424
120	2.000	0.201	0.290	0.615	0.615	0.650	0.636	0.432	0.432	0.432	0.431	0.428	0.428	0.426	0.426
125	2.083	0.204	0.300	0.636	0.636	0.672	0.658	0.438	0.438	0.438	0.437	0.434	0.434	0.432	0.433
130	2.167	0.214	0.305	0.646	0.647	0.683	0.669	0.460	0.460	0.460	0.459	0.456	0.455	0.454	0.454
135	2.250	0.229	0.309	0.655	0.655	0.692	0.678	0.492	0.492	0.492	0.491	0.488	0.487	0.485	0.486
140	2.333	0.241	0.310	0.657	0.658	0.694	0.680	0.518	0.518	0.518	0.517	0.513	0.513	0.511	0.511
145	2.417	0.249	0.317	0.672	0.672	0.710	0.695	0.535	0.535	0.535	0.534	0.530	0.530	0.528	0.528
150	2.500	0.251	0.321	0.680	0.681	0.719	0.704	0.539	0.539	0.539	0.538	0.534	0.534	0.532	0.532
155	2.583	0.256	0.327	0.693	0.694	0.732	0.717	0.550	0.550	0.550	0.549	0.545	0.545	0.543	0.543
160	2.667	0.270	0.333	0.706	0.706	0.746	0.731	0.580	0.580	0.580	0.579	0.575	0.575	0.572	0.573
165	2.750	0.278	0.346	0.733	0.734	0.775	0.759	0.597	0.597	0.597	0.596	0.592	0.592	0.589	0.590
170	2.833	0.281	0.361	0.765	0.766	0.809	0.792	0.604	0.604	0.604	0.602	0.598	0.598	0.596	0.596
175	2.917	0.283	0.381	0.807	0.808	0.853	0.836	0.608	0.608	0.608	0.607	0.603	0.602	0.600	0.600
180	3.000	0.295	0.408	0.865	0.865	0.914	0.895	0.634	0.634	0.634	0.632	0.628	0.628	0.625	0.626
185	3.083	0.322	0.430	0.911	0.912	0.963	0.943	0.692	0.692	0.692	0.690	0.686	0.685	0.683	0.683
190	3.167	0.352	0.477	1.011	1.012	1.068	1.047	0.756	0.756	0.756	0.755	0.749	0.749	0.746	0.747
195	3.250	0.409	0.514	1.089	1.090	1.151	1.128	0.879	0.879	0.879	0.877	0.871	0.870	0.867	0.867

Time (min)	Time (hrs)	SDN 3 (DA<8mi^2)	SDN 5 (DA>12mi^2)	100-Year, 6-Hour											
				TAV01	TAV02	TAV03	TAV04	TAV05	TAV06	TAV07	TAV08	TAV09	TAV10	TAV11	TAV12
				2.119	2.121	2.240	2.194	2.149	2.148	2.148	2.144	2.129	2.128	2.120	2.121
200	3.333	0.499	0.561	1.189	1.190	1.257	1.231	1.072	1.072	1.072	1.070	1.062	1.062	1.058	1.058
205	3.417	0.590	0.630	1.335	1.336	1.411	1.382	1.268	1.267	1.267	1.265	1.256	1.256	1.251	1.251
210	3.500	0.710	0.710	1.504	1.506	1.590	1.558	1.526	1.525	1.525	1.522	1.512	1.511	1.505	1.506
215	3.583	0.744	0.720	1.526	1.527	1.613	1.580	1.599	1.598	1.598	1.595	1.584	1.583	1.577	1.578
220	3.667	0.781	0.731	1.549	1.550	1.637	1.604	1.678	1.678	1.678	1.674	1.663	1.662	1.656	1.657
225	3.750	0.812	0.752	1.593	1.595	1.684	1.650	1.745	1.744	1.744	1.741	1.729	1.728	1.721	1.722
230	3.833	0.819	0.779	1.651	1.652	1.745	1.709	1.760	1.759	1.759	1.756	1.744	1.743	1.736	1.737
235	3.917	0.835	0.790	1.674	1.676	1.770	1.733	1.794	1.794	1.794	1.790	1.778	1.777	1.770	1.771
240	4.000	0.851	0.795	1.685	1.686	1.781	1.744	1.829	1.828	1.828	1.825	1.812	1.811	1.804	1.805
245	4.083	0.856	0.804	1.704	1.705	1.801	1.764	1.840	1.839	1.839	1.835	1.822	1.822	1.815	1.816
250	4.167	0.860	0.810	1.716	1.718	1.814	1.777	1.848	1.847	1.847	1.844	1.831	1.830	1.823	1.824
255	4.250	0.868	0.820	1.738	1.739	1.837	1.799	1.865	1.864	1.864	1.861	1.848	1.847	1.840	1.841
260	4.333	0.876	0.826	1.750	1.752	1.850	1.812	1.883	1.882	1.882	1.878	1.865	1.864	1.857	1.858
265	4.417	0.888	0.840	1.780	1.782	1.882	1.843	1.908	1.907	1.907	1.904	1.891	1.890	1.883	1.883
270	4.500	0.910	0.859	1.820	1.822	1.924	1.885	1.956	1.955	1.955	1.951	1.937	1.936	1.929	1.930
275	4.583	0.926	0.889	1.884	1.886	1.991	1.950	1.990	1.989	1.989	1.985	1.971	1.971	1.963	1.964
280	4.667	0.937	0.910	1.928	1.930	2.038	1.997	2.014	2.013	2.013	2.009	1.995	1.994	1.986	1.987
285	4.750	0.950	0.938	1.988	1.989	2.101	2.058	2.042	2.041	2.041	2.037	2.023	2.022	2.014	2.015
290	4.833	0.970	0.966	2.047	2.049	2.164	2.119	2.085	2.084	2.084	2.080	2.065	2.064	2.056	2.057
295	4.917	0.976	0.970	2.055	2.057	2.173	2.128	2.097	2.096	2.096	2.093	2.078	2.077	2.069	2.070
300	5.000	0.982	0.974	2.064	2.066	2.182	2.137	2.110	2.109	2.109	2.105	2.091	2.090	2.082	2.083
305	5.083	0.985	0.979	2.075	2.076	2.193	2.148	2.117	2.116	2.116	2.112	2.097	2.096	2.088	2.089
310	5.167	0.987	0.981	2.079	2.081	2.197	2.152	2.121	2.120	2.120	2.116	2.101	2.100	2.092	2.093
315	5.250	0.989	0.983	2.083	2.085	2.202	2.157	2.125	2.124	2.124	2.120	2.106	2.105	2.097	2.098
320	5.333	0.990	0.985	2.087	2.089	2.206	2.161	2.128	2.127	2.127	2.123	2.108	2.107	2.099	2.100
325	5.417	0.993	0.989	2.096	2.098	2.215	2.170	2.134	2.133	2.133	2.129	2.114	2.113	2.105	2.106
330	5.500	0.993	0.990	2.098	2.100	2.218	2.172	2.134	2.133	2.133	2.129	2.114	2.113	2.105	2.106
335	5.583	0.994	0.992	2.102	2.104	2.222	2.176	2.136	2.135	2.135	2.131	2.116	2.115	2.107	2.108
340	5.667	0.995	0.993	2.104	2.106	2.224	2.179	2.138	2.137	2.137	2.133	2.118	2.117	2.109	2.110
345	5.750	0.998	0.996	2.111	2.113	2.231	2.185	2.145	2.144	2.144	2.140	2.125	2.124	2.116	2.117
350	5.833	0.998	0.997	2.113	2.115	2.233	2.187	2.145	2.144	2.144	2.140	2.125	2.124	2.116	2.117
355	5.917	0.999	0.999	2.117	2.119	2.238	2.192	2.147	2.146	2.146	2.142	2.127	2.126	2.118	2.119
360	6.000	1.000	1.000	2.119	2.121	2.240	2.194	2.149	2.148	2.148	2.144	2.129	2.128	2.120	2.121

RUNOFF CURVE NUMBERS
(SEMIARID RANGELANDS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition[2]	A[3]	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

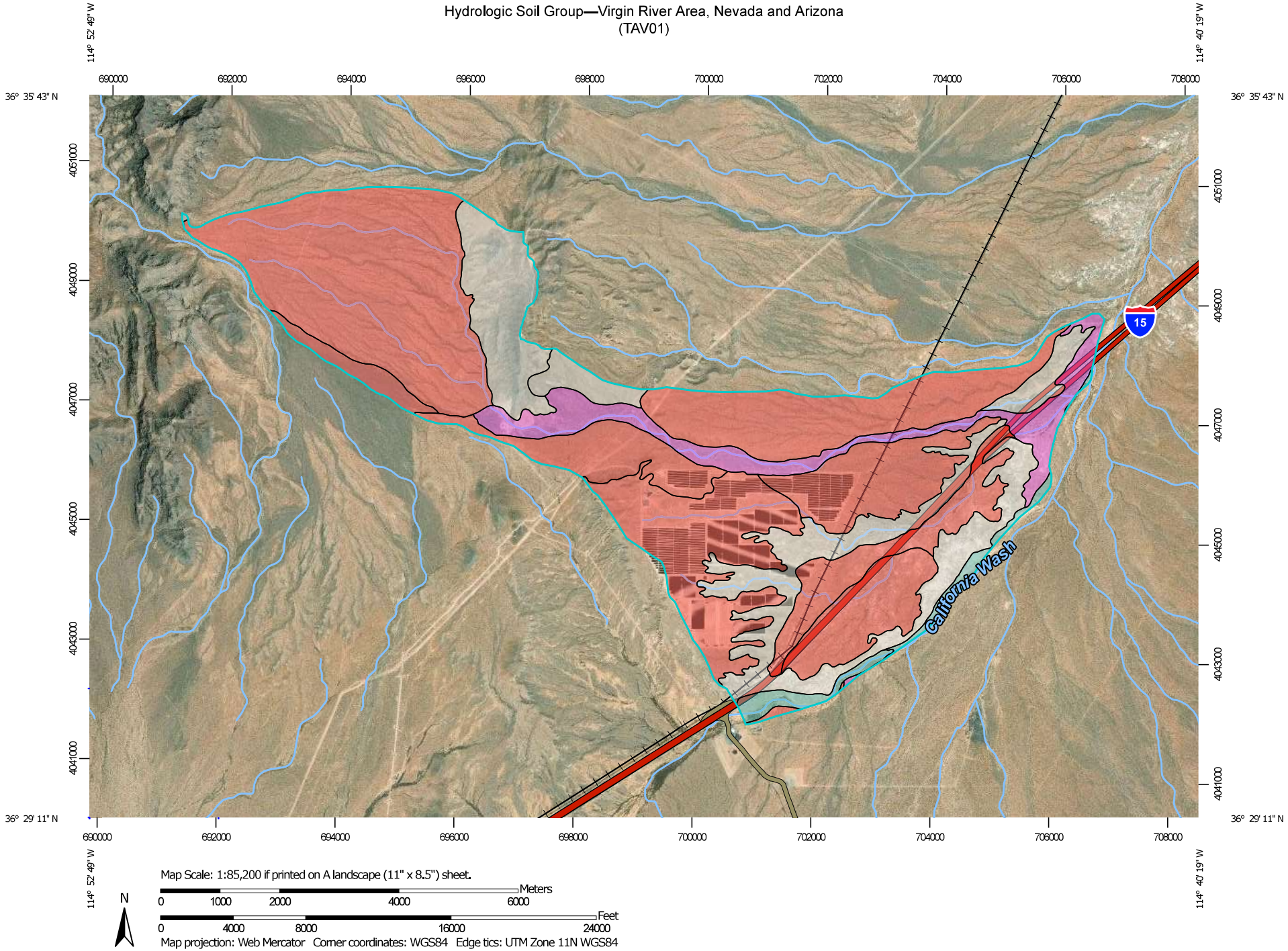
[1]Average runoff condition, and $I_a = 0.2S$.

[2]*Poor:* <30% ground cover (litter, grass, and brush overstory).
Fair: 30 to 70% ground cover.
Good: >70% ground cover.

[3]Curve numbers for group A have been developed only for desert shrub.

Revision	Date

Hydrologic Soil Group—Virgin River Area, Nevada and Arizona
(TAV01)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Virgin River Area, Nevada and Arizona
Survey Area Data: Version 17, Aug 26, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 3, 2016—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BD	Badland		1,782.8	14.6%
BHC	Bard gravelly fine sandy loam, 2 to 8 percent slopes	D	3,466.6	28.3%
BNB	Bard very stony loam, 2 to 4 percent slopes	D	192.5	1.6%
Gr	Glendale loam	C	126.6	1.0%
Gs	Glendale loam, strongly saline	C	148.3	1.2%
MOB	Mormon Mesa fine sandy loam, 0 to 8 percent slopes	D	4,757.2	38.9%
RTF	Rock land-St. Thomas association, very steep		819.8	6.7%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	946.7	7.7%
Totals for Area of Interest			**12,240.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

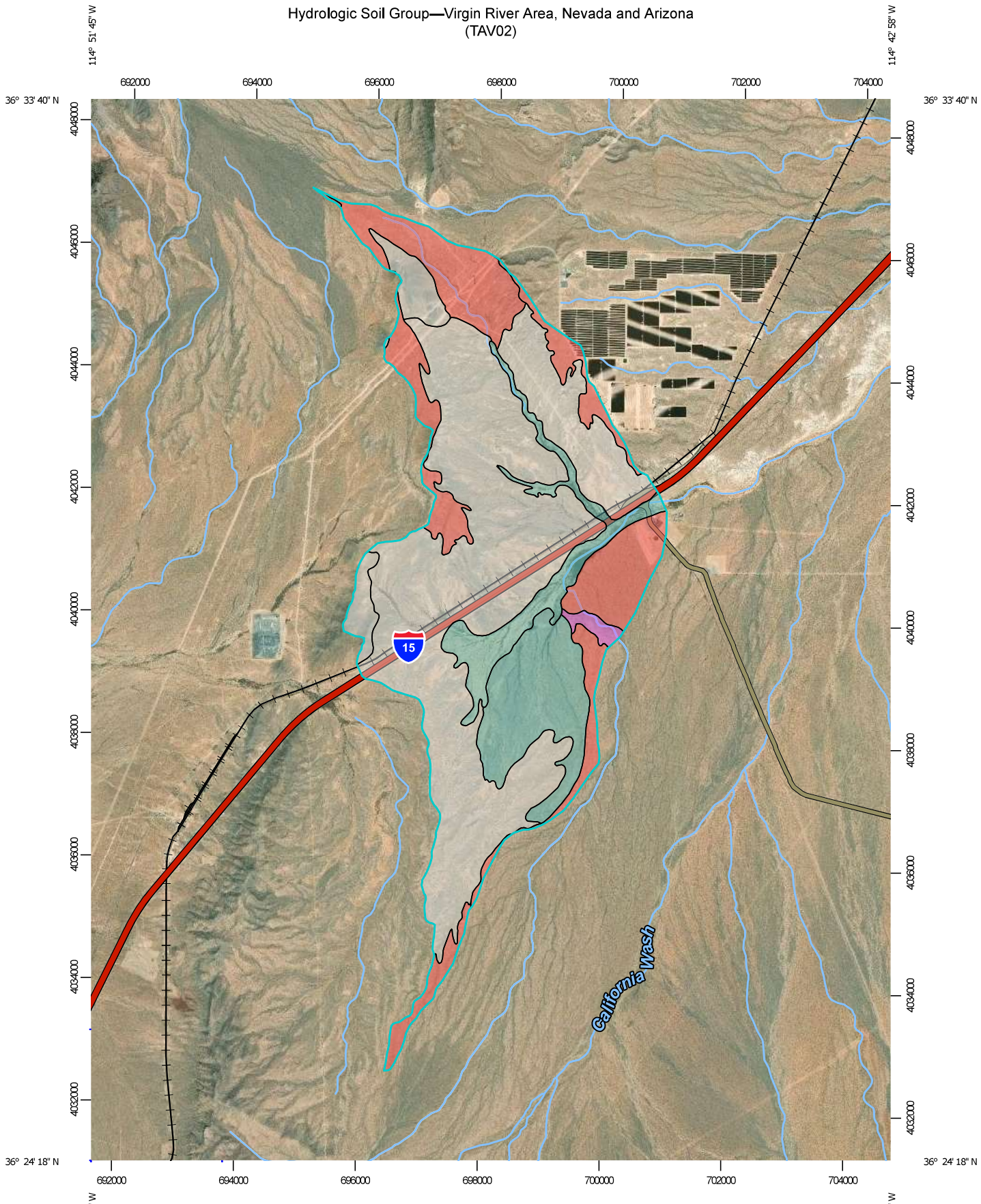
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Virgin River Area, Nevada and Arizona (TAV02)



Map Scale: 1:84,500 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 1000 2000 4000 6000

Feet: 0 4000 8000 16000 24000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Virgin River Area, Nevada and Arizona
Survey Area Data: Version 17, Aug 26, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 3, 2016—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BD	Badland		4,726.3	55.8%
BHC	Bard gravelly fine sandy loam, 2 to 8 percent slopes	D	1,376.3	16.2%
BNB	Bard very stony loam, 2 to 4 percent slopes	D	4.4	0.1%
BOB	Bard-Rough broken land association, gently sloping	D	136.0	1.6%
Gs	Glendale loam, strongly saline	C	571.8	6.7%
MOB	Mormon Mesa fine sandy loam, 0 to 8 percent slopes	D	369.7	4.4%
RTF	Rock land-St. Thomas association, very steep		331.3	3.9%
SP	Spring silty clay loam	C	891.7	10.5%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	64.7	0.8%
Totals for Area of Interest			**8,472.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

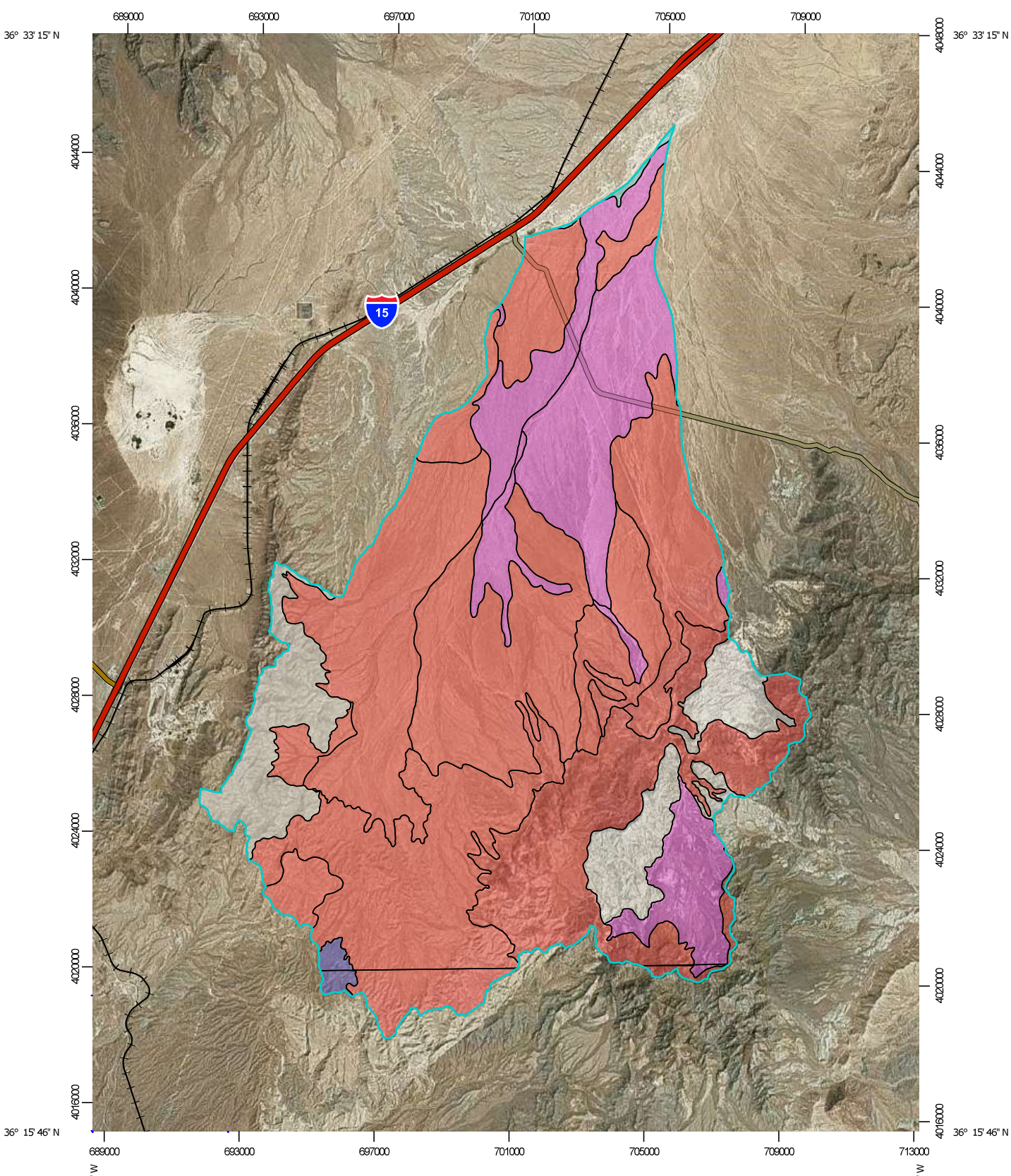
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Clark County Area, Nevada, and Virgin River Area, Nevada and Arizona
(TAV03)



Map Scale: 1:158,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 2000 4000 8000 12000

Feet
0 5000 10000 20000 30000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clark County Area, Nevada
Survey Area Data: Version 16, Aug 26, 2020

Soil Survey Area: Virgin River Area, Nevada and Arizona
Survey Area Data: Version 17, Aug 26, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
168	Upperline very gravelly sandy loam, 8 to 30 percent slopes	B	155.6	0.3%
176	St. Thomas association	D	1,321.6	2.2%
272	Moapa-Bluepoint-Rock outcrop association	A	40.8	0.1%
340	Zeheme-Rock outcrop association	D	136.4	0.2%
Subtotals for Soil Survey Area			**1,654.4**	**2.7%**
Totals for Area of Interest			**60,868.8**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AOB	Arada fine sand, gravelly substratum, 0 to 4 percent slopes	A	5,411.3	8.9%
ASC	Arada fine sand, hardpan variant, 2 to 8 percent slopes	A	997.0	1.6%
BD	Badland		0.0	0.0%
BHC	Bard gravelly fine sandy loam, 2 to 8 percent slopes	D	11,978.0	19.7%
BMD	Bard very gravelly fine sandy loam, 2 to 15 percent slopes	D	4,012.7	6.6%
BNB	Bard very stony loam, 2 to 4 percent slopes	D	1,020.5	1.7%
BOB	Bard-Rough broken land association, gently sloping	D	7,161.3	11.8%
Gr	Glendale loam	C	89.3	0.1%
Gs	Glendale loam, strongly saline	C	9.1	0.0%
MAE	Moapa-Bluepoint-Rock outcrop association	A	2,209.8	3.6%
MMB	Mormon Mesa loamy fine sand, 0 to 4 percent slopes	D	601.1	1.0%
MOB	Mormon Mesa fine sandy loam, 0 to 8 percent slopes	D	754.6	1.2%
RME	Rock land-Moapa association, hilly		3,320.3	5.5%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
RTF	Rock land-St. Thomas association, very steep		3,246.3	5.3%
SQE	St. Thomas association	D	7,631.2	12.5%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	2,689.3	4.4%
UPE	Upperline very gravelly sandy loam, 8 to 30 percent slopes	B	170.4	0.3%
WEE	Weiser cobbly sandy loam, 15 to 30 percent slopes	A	77.0	0.1%
ZAG	Zeheme-Rock outcrop association	D	7,835.3	12.9%
Subtotals for Soil Survey Area			**59,214.4**	**97.3%**
Totals for Area of Interest			**60,868.8**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

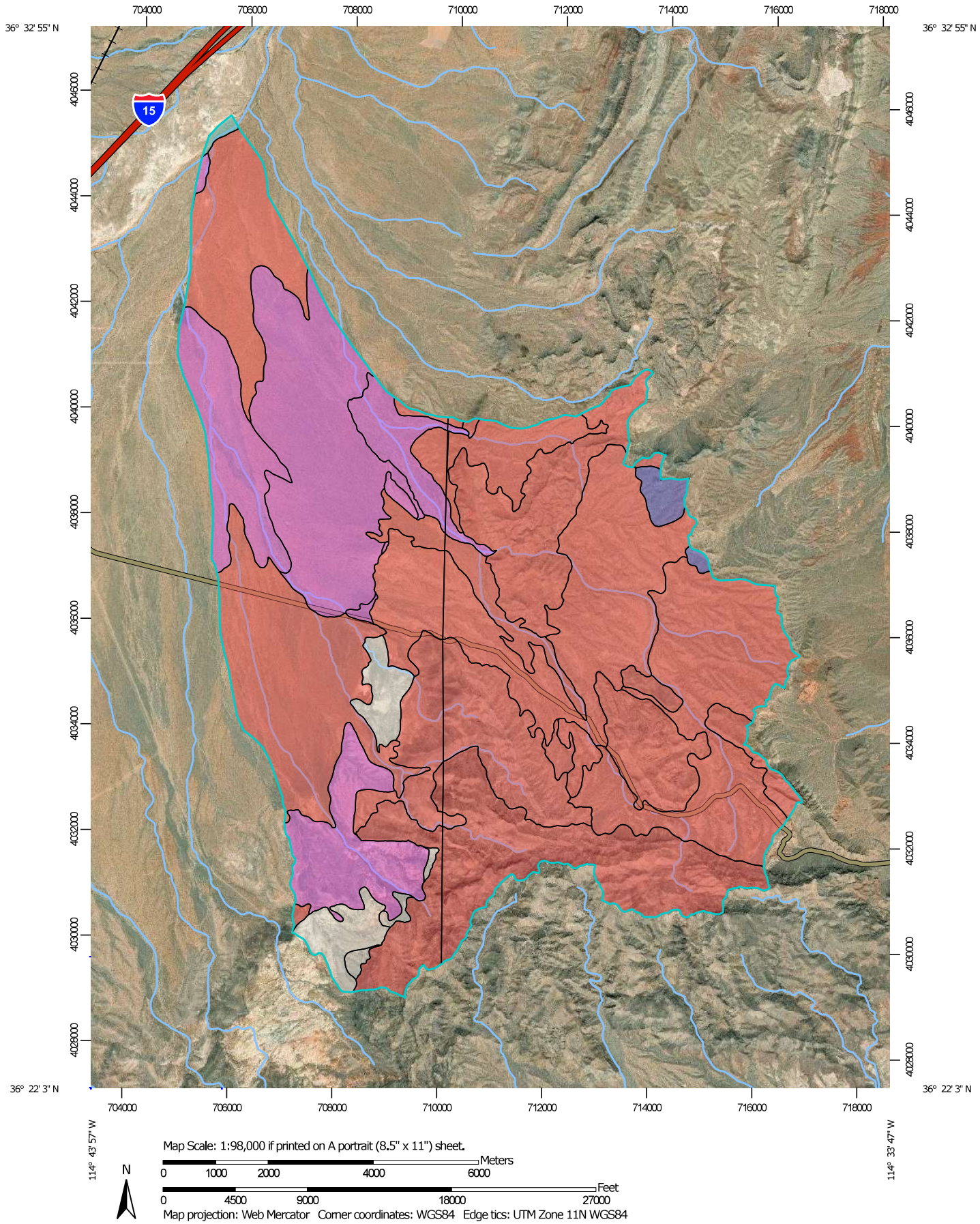
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Clark County Area, Nevada, and Virgin River Area, Nevada and Arizona
(TAV04)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clark County Area, Nevada
Survey Area Data: Version 16, Aug 26, 2020

Soil Survey Area: Virgin River Area, Nevada and Arizona
Survey Area Data: Version 17, Aug 26, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 24, 2015—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
105	Galehills extremely gravelly fine sandy loam, 15 to 50 percent slopes	D	15.6	0.1%
167	Upperline-St. Thomas-Upperline association	B	182.4	0.7%
168	Upperline very gravelly sandy loam, 8 to 30 percent slopes	B	34.7	0.1%
175	St. Thomas-Rock outcrop complex	D	3,614.5	14.0%
177	St. Thomas-Upperline-Whitebasin complex	D	141.6	0.5%
178	St. Thomas-Iceberg-Rock outcrop association	D	223.9	0.9%
232	Wechech-Upperline association	D	81.1	0.3%
234	Wechech very gravelly fine sandy loam, 8 to 30 percent slopes	D	3,205.4	12.4%
237	Wechech association	D	345.0	1.3%
340	Zeheme-Rock outcrop association	D	2,184.3	8.4%
380	Tonopah-Arizo association	A	62.2	0.2%
604	Huevi-Hiller association	A	0.0	0.0%
871	Irongold-Weiser association	D	2,736.0	10.6%
Subtotals for Soil Survey Area			**12,826.8**	**49.6%**
Totals for Area of Interest			**25,851.4**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AOB	Arada fine sand, gravelly substratum, 0 to 4 percent slopes	A	1,183.8	4.6%
BD	Badland		312.3	1.2%
BMD	Bard very gravelly fine sandy loam, 2 to 15 percent slopes	D	2,459.9	9.5%
Gr	Glendale loam	C	38.7	0.1%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
MMB	Mormon Mesa loamy fine sand, 0 to 4 percent slopes	D	1,498.2	5.8%
RME	Rock land-Moapa association, hilly		391.4	1.5%
RTF	Rock land-St. Thomas association, very steep		104.4	0.4%
STF	St. Thomas-Rock outcrop complex	D	684.0	2.6%
TGC	Tonopah-Arizo association	A	492.8	1.9%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	2,864.3	11.1%
WAC	Wechech association	D	174.3	0.7%
WBE	Wechech very gravelly fine sandy loam, 8 to 30 percent slopes	D	802.7	3.1%
WEE	Weiser cobbly sandy loam, 15 to 30 percent slopes	A	1,253.0	4.8%
ZAG	Zeheme-Rock outcrop association	D	764.7	3.0%
Subtotals for Soil Survey Area			**13,024.5**	**50.4%**
Totals for Area of Interest			**25,851.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

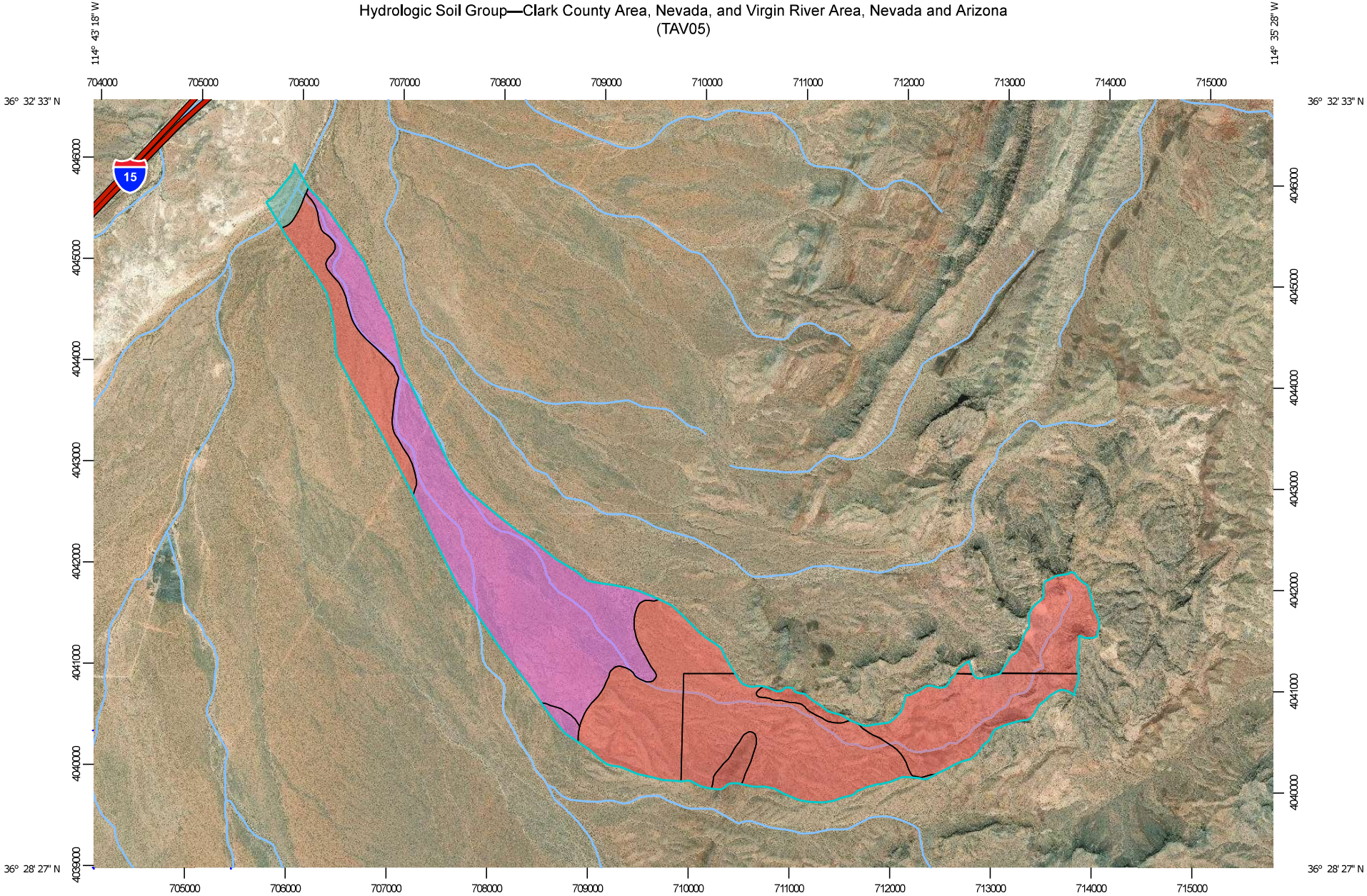
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Clark County Area, Nevada, and Virgin River Area, Nevada and Arizona
(TAV05)



Map Scale: 1:53,500 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2500 5000 10000 15000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clark County Area, Nevada
Survey Area Data: Version 16, Aug 26, 2020

Soil Survey Area: Virgin River Area, Nevada and Arizona
Survey Area Data: Version 17, Aug 26, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 3, 2016—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
105	Galehills extremely gravelly fine sandy loam, 15 to 50 percent slopes	D	30.5	1.3%
175	St. Thomas-Rock outcrop complex	D	293.6	12.9%
234	Wechech very gravelly fine sandy loam, 8 to 30 percent slopes	D	431.0	18.9%
Subtotals for Soil Survey Area			**755.0**	**33.2%**
Totals for Area of Interest			**2,277.1**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Gr	Glendale loam	C	31.1	1.4%
MMB	Mormon Mesa loamy fine sand, 0 to 4 percent slopes	D	183.7	8.1%
STF	St. Thomas-Rock outcrop complex	D	146.4	6.4%
TGC	Tonopah-Arizo association	A	14.2	0.6%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	813.9	35.7%
WBE	Wechech very gravelly fine sandy loam, 8 to 30 percent slopes	D	332.8	14.6%
Subtotals for Soil Survey Area			**1,522.1**	**66.8%**
Totals for Area of Interest			**2,277.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

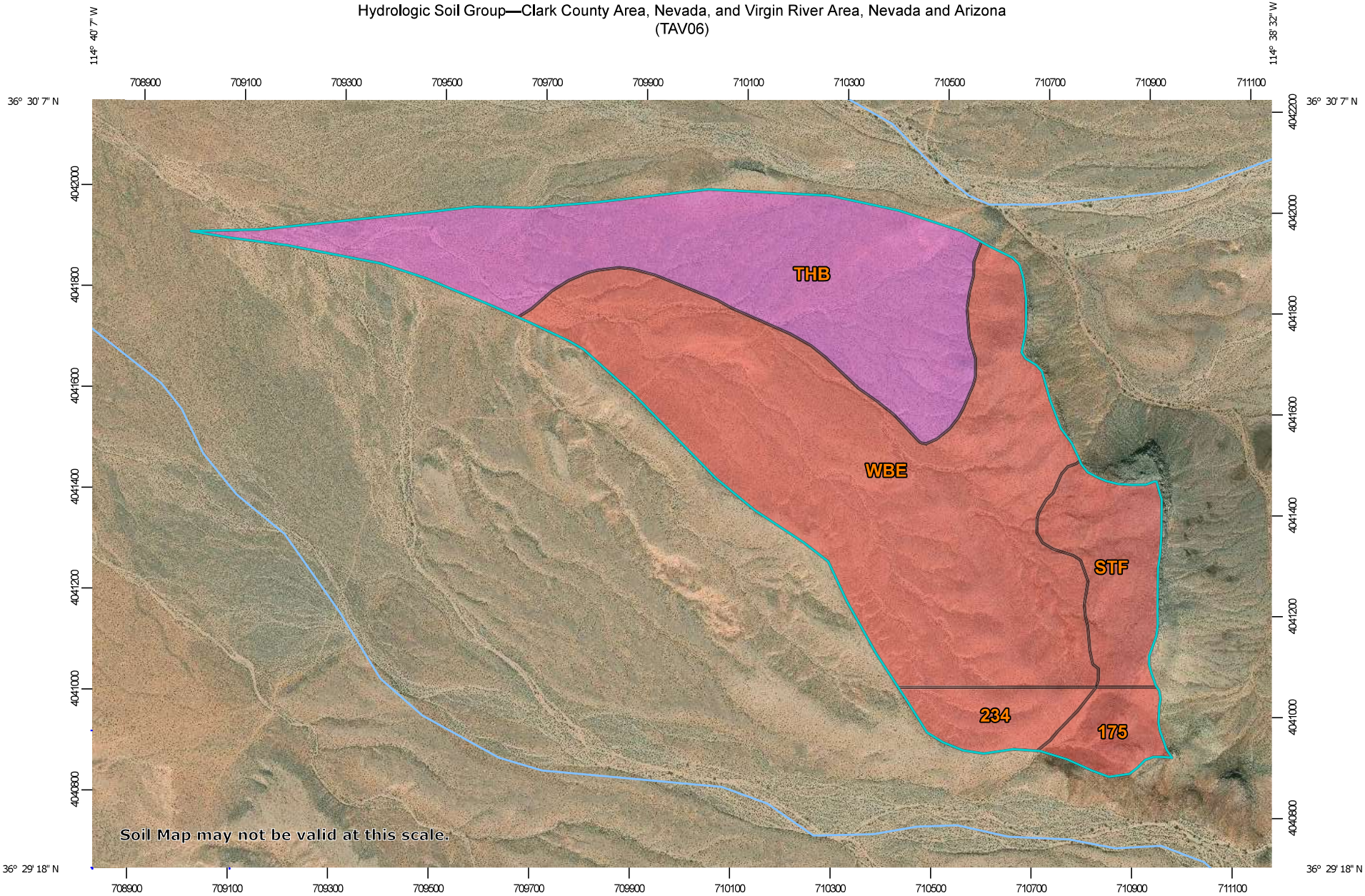
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Clark County Area, Nevada, and Virgin River Area, Nevada and Arizona
(TAV06)



Map Scale: 1:10,700 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 150 300 600 900

Feet
0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clark County Area, Nevada
Survey Area Data: Version 16, Aug 26, 2020

Soil Survey Area: Virgin River Area, Nevada and Arizona
Survey Area Data: Version 17, Aug 26, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 3, 2016—Oct 1, 2017

MAP LEGEND

MAP INFORMATION

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
175	St. Thomas-Rock outcrop complex	D	7.5	3.4%
234	Wechech very gravelly fine sandy loam, 8 to 30 percent slopes	D	9.2	4.2%
Subtotals for Soil Survey Area			**16.7**	**7.6%**
Totals for Area of Interest			**219.3**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
STF	St. Thomas-Rock outcrop complex	D	17.3	7.9%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	73.1	33.3%
WBE	Wechech very gravelly fine sandy loam, 8 to 30 percent slopes	D	112.2	51.2%
Subtotals for Soil Survey Area			**202.6**	**92.4%**
Totals for Area of Interest			**219.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

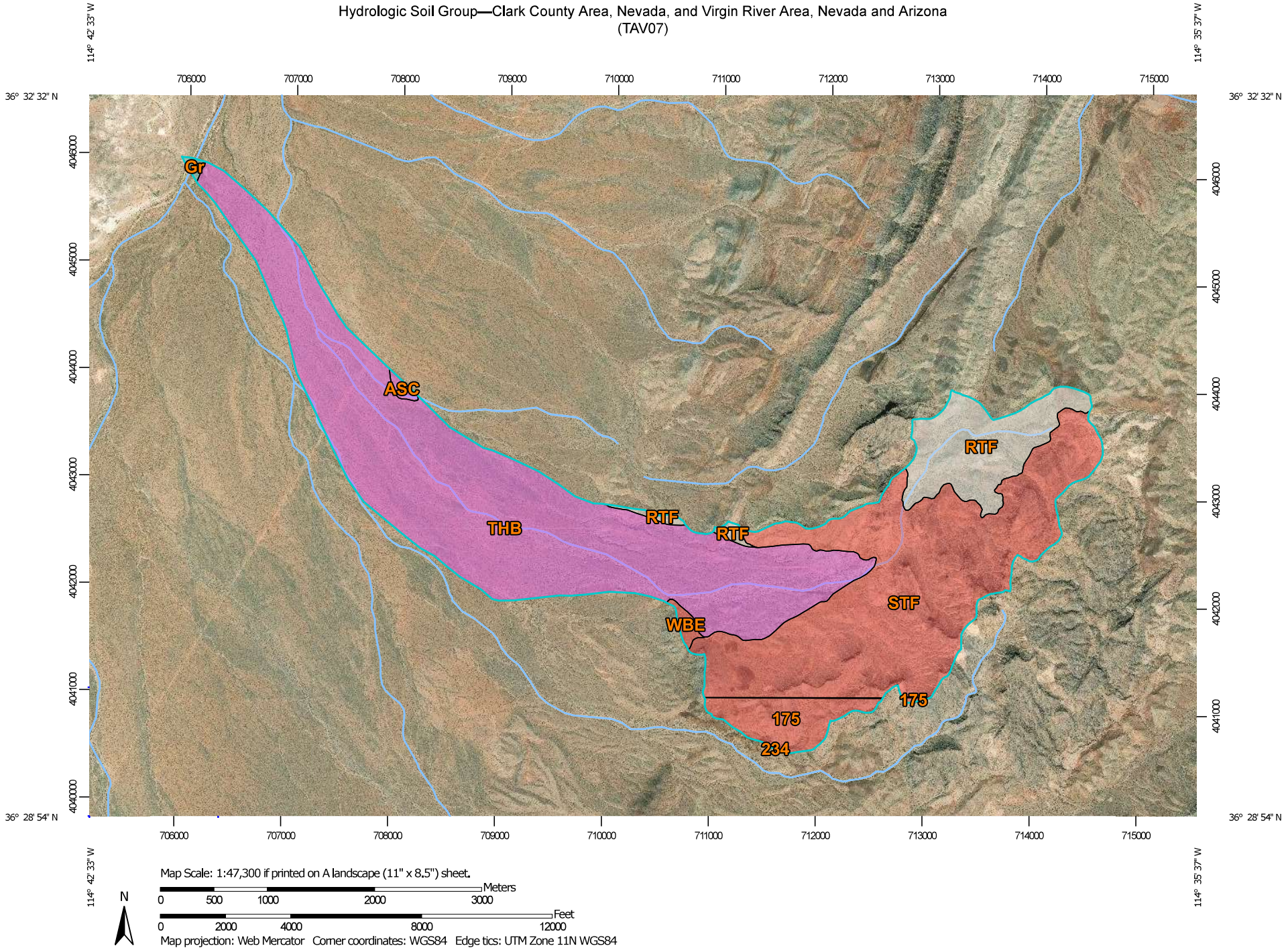
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Clark County Area, Nevada, and Virgin River Area, Nevada and Arizona
(TAV07)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clark County Area, Nevada
Survey Area Data: Version 16, Aug 26, 2020

Soil Survey Area: Virgin River Area, Nevada and Arizona
Survey Area Data: Version 17, Aug 26, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 24, 2015—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
175	St. Thomas-Rock outcrop complex	D	129.0	4.4%
234	Wechech very gravelly fine sandy loam, 8 to 30 percent slopes	D	0.1	0.0%
Subtotals for Soil Survey Area			**129.1**	**4.4%**
Totals for Area of Interest			**2,926.5**	**100.0%**

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ASC	Arada fine sand, hardpan variant, 2 to 8 percent slopes	A	8.8	0.3%
Gr	Glendale loam	C	6.0	0.2%
RTF	Rock land-St. Thomas association, very steep		280.5	9.6%
STF	St. Thomas-Rock outcrop complex	D	1,029.7	35.2%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	1,458.1	49.8%
WBE	Wechech very gravelly fine sandy loam, 8 to 30 percent slopes	D	14.2	0.5%
Subtotals for Soil Survey Area			**2,797.3**	**95.6%**
Totals for Area of Interest			**2,926.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

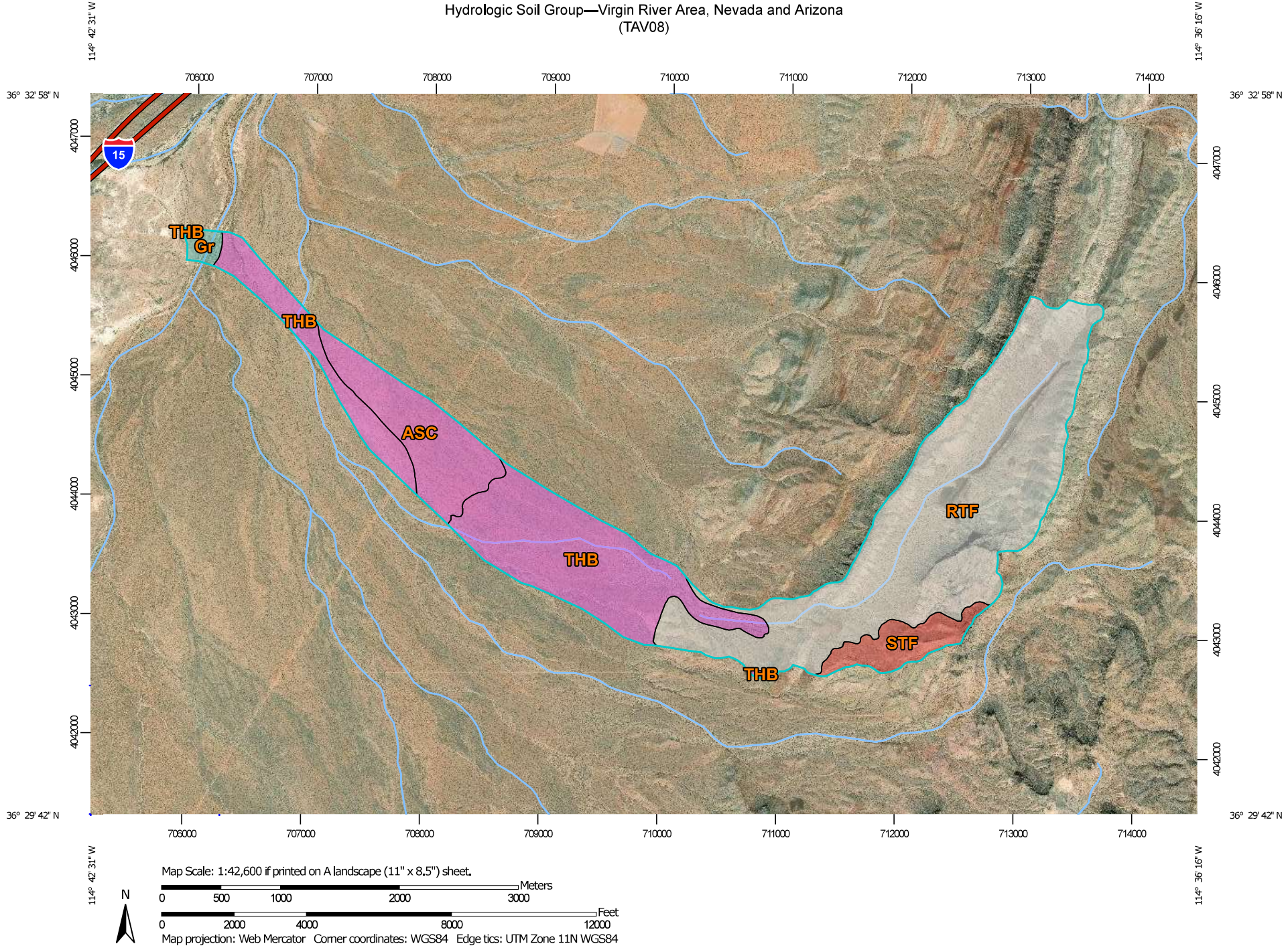
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Virgin River Area, Nevada and Arizona
(TAV08)



Map Scale: 1:42,600 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2000 4000 8000 12000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Virgin River Area, Nevada and Arizona
Survey Area Data: Version 17, Aug 26, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 3, 2016—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ASC	Arada fine sand, hardpan variant, 2 to 8 percent slopes	A	198.4	11.5%
Gr	Glendale loam	C	18.7	1.1%
RTF	Rock land-St. Thomas association, very steep		911.1	53.0%
STF	St. Thomas-Rock outcrop complex	D	86.9	5.1%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	504.1	29.3%
Totals for Area of Interest			**1,719.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

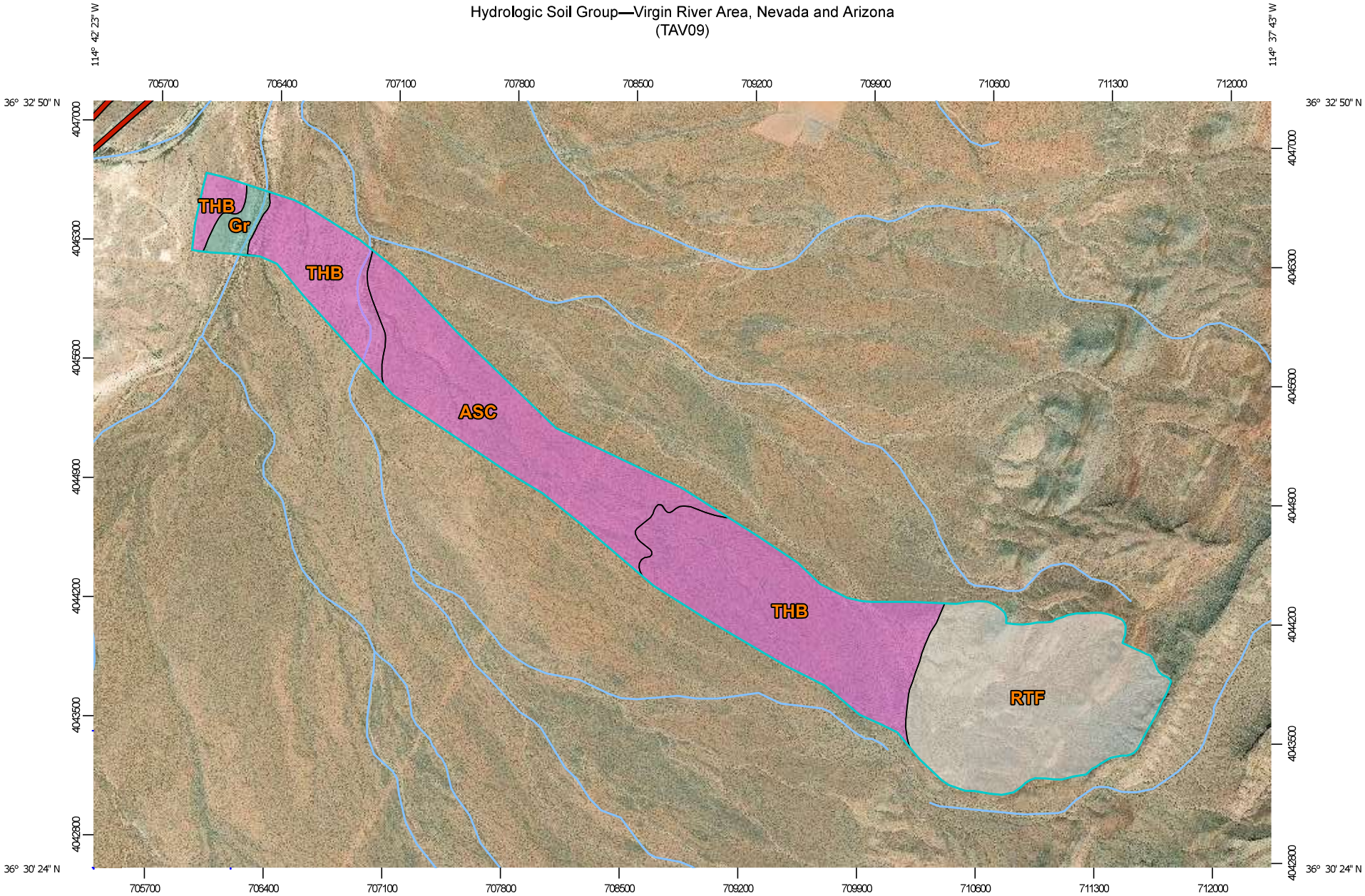
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Virgin River Area, Nevada and Arizona
(TAV09)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Virgin River Area, Nevada and Arizona
Survey Area Data: Version 17, Aug 26, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 3, 2016—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ASC	Arada fine sand, hardpan variant, 2 to 8 percent slopes	A	241.8	25.2%
Gr	Glendale loam	C	20.1	2.1%
RTF	Rock land-St. Thomas association, very steep		323.4	33.7%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	374.2	39.0%
Totals for Area of Interest			**959.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

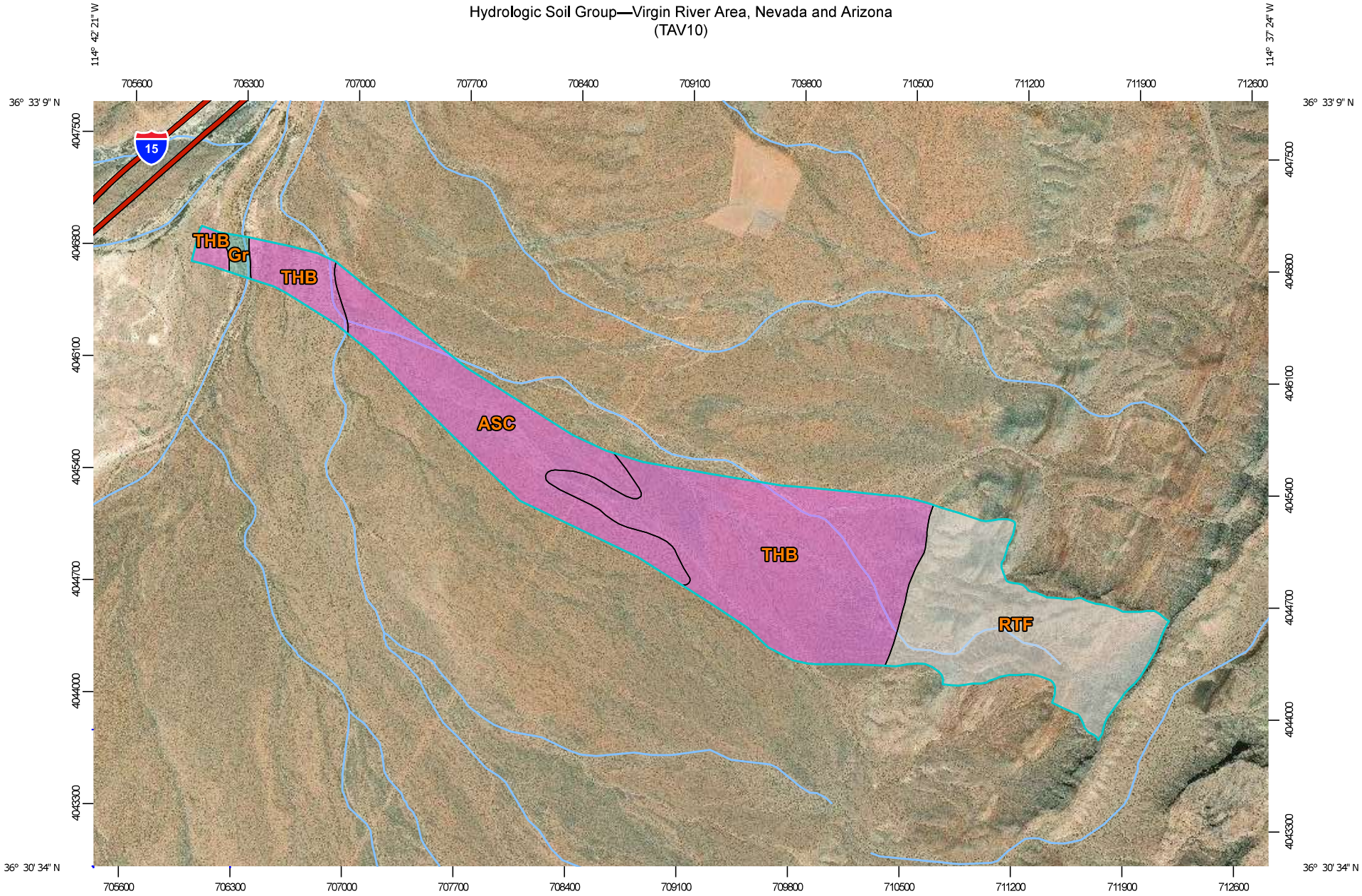
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Virgin River Area, Nevada and Arizona
(TAV10)



Map Scale: 1:33,700 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 450 900 1800 2700

Feet
0 1500 3000 6000 9000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Virgin River Area, Nevada and Arizona
Survey Area Data: Version 17, Aug 26, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 3, 2016—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ASC	Arada fine sand, hardpan variant, 2 to 8 percent slopes	A	228.1	22.8%
Gr	Glendale loam	C	8.9	0.9%
RTF	Rock land-St. Thomas association, very steep		293.9	29.4%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	468.0	46.9%
Totals for Area of Interest			**999.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

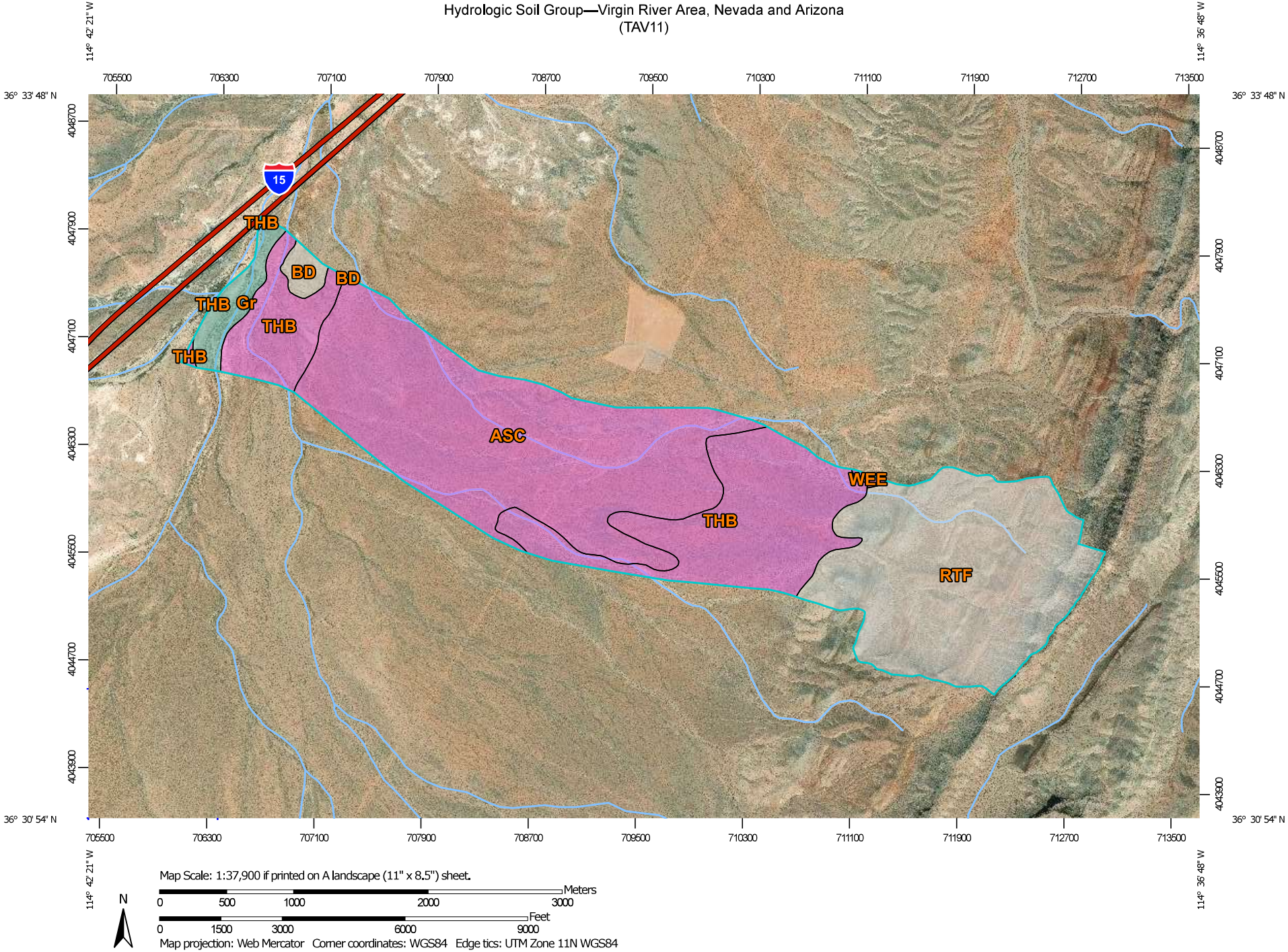
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Virgin River Area, Nevada and Arizona
(TAV11)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Virgin River Area, Nevada and Arizona
Survey Area Data: Version 17, Aug 26, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 3, 2016—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ASC	Arada fine sand, hardpan variant, 2 to 8 percent slopes	A	806.1	40.3%
BD	Badland		23.2	1.2%
Gr	Glendale loam	C	56.3	2.8%
RTF	Rock land-St. Thomas association, very steep		618.7	30.9%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	491.5	24.6%
WEE	Weiser cobbly sandy loam, 15 to 30 percent slopes	A	3.5	0.2%
Totals for Area of Interest			**1,999.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

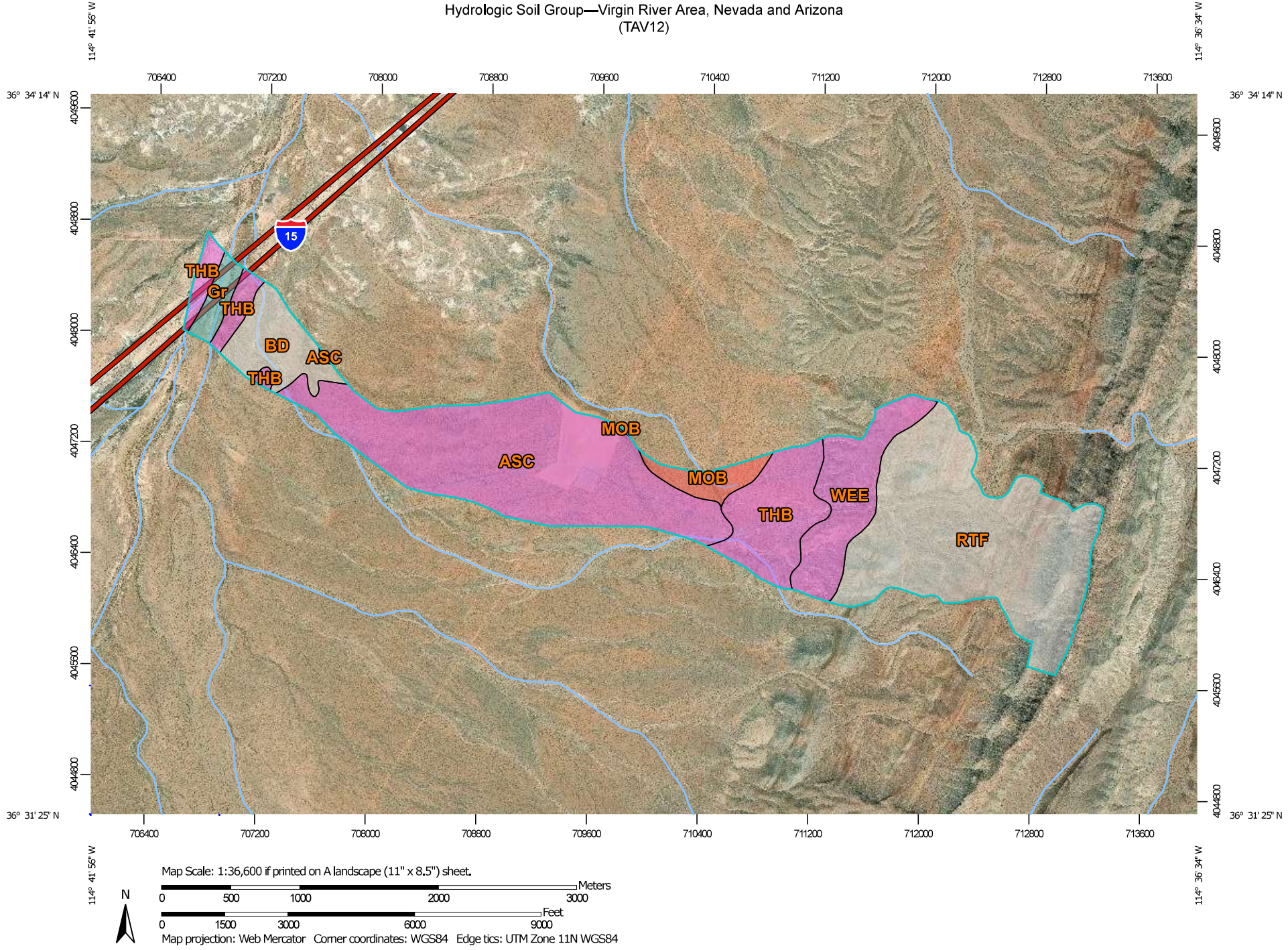
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Hydrologic Soil Group—Virgin River Area, Nevada and Arizona
(TAV12)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 3, 2016—Oct 1, 2017

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Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ASC	Arada fine sand, hardpan variant, 2 to 8 percent slopes	A	448.3	33.0%
BD	Badland		84.3	6.2%
Gr	Glendale loam	C	26.3	1.9%
MOB	Mormon Mesa fine sandy loam, 0 to 8 percent slopes	D	36.7	2.7%
RTF	Rock land-St. Thomas association, very steep		458.8	33.8%
THB	Tonopah gravelly sandy loam, 0 to 4 percent slopes	A	171.6	12.6%
WEE	Weiser cobbly sandy loam, 15 to 30 percent slopes	A	132.4	9.7%
Totals for Area of Interest			**1,358.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

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If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

HEC-HMS Hydrograph Results

Time	Flow (cfs)											
(hours)	TAV01	TAV02	TAV03	TAV04	TAV05	TAV06	TAV07	TAV08	TAV09	TAV10	TAV11	TAV12
0.000	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.083	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.167	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.250	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.333	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.417	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.500	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.583	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.667	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.750	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.833	0.00	0.100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.917	0.00	0.200	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.000	0.00	0.500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.083	0.00	1.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.167	0.00	1.700	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.250	0.10	3.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.333	0.20	4.800	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.417	0.40	7.500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.500	0.90	11.400	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.583	1.70	16.900	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.667	2.90	24.300	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.750	4.60	33.700	0.80	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.833	6.90	45.400	1.60	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.917	10.10	59.800	2.90	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.000	14.30	77.200	5.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.083	19.60	97.200	7.90	2.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.167	26.30	119.100	11.80	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.250	34.20	142.000	16.60	6.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.333	43.30	165.300	22.40	9.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.417	53.60	188.800	29.30	12.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.500	64.90	211.200	37.20	16.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.583	77.40	231.400	46.30	21.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.667	90.90	248.500	56.90	28.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.750	105.50	263.000	69.50	35.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.833	121.40	276.500	84.70	45.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.917	138.70	292.000	103.20	57.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Time	Flow (cfs)											
(hours)	TAV01	TAV02	TAV03	TAV04	TAV05	TAV06	TAV07	TAV08	TAV09	TAV10	TAV11	TAV12
3.000	157.90	311.900	126.50	72.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.083	179.30	339.400	155.10	91.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.167	205.00	380.800	192.50	116.80	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00
3.250	235.80	442.100	239.50	149.90	0.30	0.70	0.00	0.10	0.00	0.00	0.00	0.00
3.333	274.50	528.200	299.40	194.10	1.60	2.70	0.30	0.70	0.00	0.00	0.00	0.10
3.417	324.30	648.100	377.90	254.70	4.90	7.50	1.50	2.40	0.20	0.10	0.40	0.80
3.500	389.40	814.100	480.60	337.70	12.10	17.40	4.80	6.40	1.20	0.70	2.70	3.30
3.583	469.30	1022.500	602.90	441.60	23.60	32.10	10.70	13.00	3.50	2.10	7.90	8.10
3.667	565.00	1263.000	748.10	568.80	39.60	50.00	19.40	22.30	6.90	4.50	15.80	15.10
3.750	674.60	1529.900	918.30	717.40	60.20	67.10	30.80	34.40	11.90	7.90	27.70	24.90
3.833	797.90	1821.000	1112.20	886.80	86.10	78.60	44.90	49.50	18.70	12.70	43.90	38.00
3.917	935.80	2121.700	1326.00	1078.30	117.80	83.80	62.40	68.20	27.40	18.80	64.10	54.20
4.000	1089.10	2401.800	1560.00	1294.00	155.00	83.00	83.50	90.40	37.30	26.20	86.10	72.70
4.083	1256.00	2630.900	1817.40	1533.30	196.30	77.40	108.60	115.70	47.40	34.00	107.60	91.40
4.167	1432.60	2805.300	2099.60	1792.20	238.60	69.00	136.80	142.30	56.70	41.60	126.60	108.70
4.250	1615.70	2923.700	2407.80	2067.70	278.70	60.00	166.40	168.30	64.70	48.40	141.60	123.60
4.333	1799.30	2987.400	2741.10	2354.00	314.90	51.70	195.60	192.40	70.90	53.90	153.20	135.30
4.417	1975.70	3001.600	3101.00	2642.50	346.00	44.40	223.40	213.70	75.70	58.50	160.50	144.10
4.500	2139.90	2971.600	3488.10	2922.70	371.50	39.20	248.80	231.80	78.70	61.90	164.20	150.30
4.583	2291.40	2902.900	3902.90	3190.30	391.70	36.20	271.40	246.70	80.50	64.20	165.90	153.40
4.667	2429.60	2819.400	4341.80	3443.60	407.00	35.20	290.90	258.60	81.50	65.80	165.30	154.80
4.750	2554.70	2733.600	4801.70	3682.50	417.50	35.80	307.30	267.70	81.60	66.90	163.00	154.80
4.833	2666.20	2651.400	5275.90	3905.50	423.10	37.10	321.50	273.80	81.30	67.70	161.00	153.50
4.917	2762.20	2577.100	5752.20	4108.80	425.80	38.10	333.00	277.50	80.90	68.40	160.50	151.60
5.000	2844.10	2524.800	6224.00	4291.80	426.60	38.70	341.80	280.00	80.70	69.00	161.00	149.40
5.083	2915.10	2506.500	6686.10	4454.30	424.70	38.20	348.70	281.00	80.70	69.60	162.00	147.50
5.167	2976.20	2507.300	7132.70	4600.50	420.20	36.10	354.20	280.40	80.90	70.20	163.20	145.90
5.250	3024.60	2506.800	7559.20	4734.60	412.80	32.70	358.10	278.00	80.90	70.70	163.60	144.40
5.333	3060.30	2492.200	7963.20	4853.50	402.30	28.70	360.00	273.30	80.50	70.80	162.40	142.60
5.417	3088.70	2458.800	8344.90	4953.30	390.60	24.50	359.30	266.70	79.30	70.10	159.20	140.00
5.500	3111.90	2402.900	8704.40	5037.20	378.60	20.30	355.50	259.40	77.30	68.80	153.70	136.20
5.583	3125.20	2321.800	9041.60	5110.40	366.00	16.60	348.70	251.60	74.30	66.60	146.10	131.20
5.667	3122.60	2214.500	9356.50	5168.30	352.50	13.60	340.00	243.10	70.50	63.60	137.10	125.00
5.750	3102.00	2092.800	9650.50	5201.20	338.20	11.20	330.10	234.10	66.20	60.10	126.60	118.00
5.833	3063.20	1960.800	9925.50	5202.70	323.00	9.40	319.30	224.40	61.30	56.10	115.30	110.20
5.917	3007.00	1816.500	10182.90	5173.00	307.00	8.00	307.90	214.10	56.20	51.80	104.20	101.80
6.000	2935.50	1666.400	10419.80	5113.30	290.80	7.00	295.30	203.40	51.00	47.30	93.50	93.20

Time	Flow (cfs)											
(hours)	TAV01	TAV02	TAV03	TAV04	TAV05	TAV06	TAV07	TAV08	TAV09	TAV10	TAV11	TAV12
6.083	2853.90	1514.800	10628.40	5024.20	274.40	6.00	282.10	192.70	46.10	42.90	83.30	84.70
6.167	2767.20	1366.100	10799.40	4910.20	257.00	5.20	268.60	181.70	41.40	38.70	73.90	76.60
6.250	2676.90	1224.700	10928.00	4780.30	239.20	4.50	255.10	170.10	36.90	34.70	65.70	68.90
6.333	2582.30	1095.000	11015.60	4641.10	221.30	3.70	241.20	158.30	33.00	31.10	58.40	61.60
6.417	2483.70	981.300	11067.30	4494.70	203.70	3.00	226.90	146.50	29.40	27.80	51.90	55.10
6.500	2382.10	880.400	11085.80	4342.10	186.80	2.30	212.30	134.90	26.20	24.90	45.90	49.30
6.583	2277.90	788.500	11070.60	4183.90	170.60	1.80	197.40	123.70	23.30	22.20	40.60	44.10
6.667	2172.00	704.500	11020.60	4019.50	155.20	1.30	182.60	113.10	20.70	19.80	35.60	39.30
6.750	2066.10	628.100	10935.90	3849.60	140.70	1.00	168.30	103.00	18.30	17.50	31.10	34.90
6.833	1960.30	557.500	10817.60	3677.50	127.30	0.70	154.60	93.50	16.10	15.50	27.10	30.90
6.917	1853.30	492.700	10666.80	3506.00	115.30	0.50	141.50	84.80	14.10	13.60	23.50	27.30
7.000	1744.60	433.700	10485.00	3334.20	104.40	0.40	129.30	77.00	12.30	12.00	20.20	24.10
7.083	1634.30	380.700	10274.30	3160.20	94.40	0.30	118.10	69.80	10.70	10.40	17.30	21.10
7.167	1523.60	333.500	10037.70	2983.40	85.20	0.20	107.80	63.20	9.30	9.10	14.80	18.50
7.250	1414.30	291.300	9778.00	2804.00	76.90	0.10	98.40	57.20	8.00	7.90	12.60	16.10
7.333	1309.00	253.700	9499.00	2623.40	69.30	0.10	89.70	51.70	6.90	6.80	10.70	14.00
7.417	1210.50	220.600	9205.40	2444.50	62.30	0.10	81.80	46.70	6.00	5.90	9.20	12.20
7.500	1120.00	191.600	8901.90	2271.50	56.00	0.10	74.40	42.10	5.20	5.10	7.80	10.60
7.583	1036.80	166.600	8593.30	2108.70	50.20	0.00	67.70	37.90	4.50	4.40	6.60	9.20
7.667	960.20	144.900	8284.10	1958.20	44.90	0.00	61.50	34.10	3.90	3.90	5.60	8.00
7.750	889.00	126.000	7979.30	1819.70	40.20	0.00	55.80	30.60	3.30	3.40	4.70	7.00
7.833	822.40	109.400	7681.30	1691.90	35.90	0.00	50.60	27.40	2.90	2.90	4.00	6.10
7.917	760.40	94.700	7389.30	1573.10	32.20	0.00	45.80	24.60	2.40	2.50	3.40	5.30
8.000	703.00	81.700	7100.70	1461.70	28.80	0.00	41.40	22.10	2.10	2.20	2.80	4.60
8.083	649.80	70.200	6813.80	1357.60	25.70	0.00	37.50	19.90	1.80	1.80	2.40	3.90
8.167	600.40	60.200	6528.40	1260.60	23.10	0.00	34.00	17.80	1.50	1.60	2.00	3.40
8.250	554.40	51.400	6244.10	1170.50	20.70	0.00	30.80	16.00	1.30	1.30	1.70	2.90
8.333	511.30	44.000	5960.80	1086.50	18.50	0.00	27.90	14.40	1.10	1.10	1.50	2.40
8.417	471.00	38.000	5678.60	1008.20	16.60	0.00	25.30	12.90	0.90	1.00	1.20	2.10
8.500	433.60	32.800	5399.20	934.70	14.90	0.00	22.90	11.60	0.80	0.80	1.00	1.80
8.583	399.20	28.300	5124.80	865.80	13.40	0.00	20.70	10.50	0.70	0.70	0.80	1.50
8.667	367.80	24.400	4858.30	801.20	12.00	0.00	18.80	9.40	0.60	0.60	0.70	1.30
8.750	339.10	21.100	4602.70	741.10	10.80	0.00	17.00	8.50	0.50	0.50	0.50	1.10
8.833	312.90	18.300	4360.30	685.60	9.70	0.00	15.40	7.60	0.40	0.50	0.40	1.00
8.917	288.90	15.800	4132.10	634.80	8.70	0.00	14.00	6.90	0.30	0.40	0.30	0.80
9.000	266.70	13.500	3917.20	588.10	7.70	0.00	12.70	6.20	0.30	0.30	0.20	0.70
9.083	246.20	11.400	3714.30	545.40	6.80	0.00	11.50	5.60	0.20	0.30	0.20	0.60

Time	Flow (cfs)											
(hours)	TAV01	TAV02	TAV03	TAV04	TAV05	TAV06	TAV07	TAV08	TAV09	TAV10	TAV11	TAV12
9.167	227.10	9.500	3522.00	506.00	6.10	0.00	10.50	5.00	0.20	0.20	0.10	0.50
9.250	209.40	7.700	3338.90	469.40	5.30	0.00	9.50	4.40	0.10	0.20	0.10	0.40
9.333	193.00	6.100	3164.10	435.50	4.60	0.00	8.60	3.90	0.10	0.10	0.10	0.30
9.417	177.90	4.700	2997.40	403.80	4.00	0.00	7.80	3.50	0.10	0.10	0.10	0.20
9.500	163.90	3.600	2839.30	374.30	3.40	0.00	7.10	3.00	0.10	0.10	0.10	0.20
9.583	151.00	2.700	2690.00	346.80	2.90	0.00	6.40	2.60	0.00	0.10	0.00	0.10
9.667	139.20	2.000	2549.60	321.20	2.60	0.00	5.80	2.30	0.00	0.00	0.00	0.10
9.750	128.30	1.600	2417.60	297.40	2.20	0.00	5.20	2.00	0.00	0.00	0.00	0.10
9.833	118.40	1.300	2293.50	275.40	2.00	0.00	4.70	1.70	0.00	0.00	0.00	0.10
9.917	109.30	1.100	2176.70	255.00	1.70	0.00	4.20	1.50	0.00	0.00	0.00	0.10
10.000	101.00	0.900	2066.30	236.20	1.50	0.00	3.70	1.30	0.00	0.00	0.00	0.00
10.083	93.30	0.700	1961.40	218.80	1.30	0.00	3.30	1.20	0.00	0.00	0.00	0.00
10.167	86.10	0.500	1861.40	202.90	1.10	0.00	2.90	1.00	0.00	0.00	0.00	0.00
10.250	79.60	0.400	1765.70	188.20	1.00	0.00	2.50	0.90	0.00	0.00	0.00	0.00
10.333	73.50	0.300	1674.00	174.70	0.80	0.00	2.20	0.80	0.00	0.00	0.00	0.00
10.417	67.80	0.200	1586.00	162.20	0.70	0.00	1.90	0.70	0.00	0.00	0.00	0.00
10.500	62.60	0.100	1502.00	150.50	0.60	0.00	1.70	0.60	0.00	0.00	0.00	0.00
10.583	57.70	0.100	1422.10	139.70	0.40	0.00	1.50	0.50	0.00	0.00	0.00	0.00
10.667	53.20	0.000	1346.40	129.70	0.40	0.00	1.30	0.40	0.00	0.00	0.00	0.00
10.750	48.90	0.000	1275.20	120.40	0.30	0.00	1.20	0.30	0.00	0.00	0.00	0.00
10.833	44.90	0.000	1208.20	111.70	0.20	0.00	1.00	0.20	0.00	0.00	0.00	0.00
10.917	41.20	0.000	1145.30	103.60	0.20	0.00	0.90	0.20	0.00	0.00	0.00	0.00
11.000	37.70	0.000	1086.30	96.10	0.10	0.00	0.80	0.10	0.00	0.00	0.00	0.00
11.083	34.40	0.000	1030.60	89.10	0.10	0.00	0.60	0.10	0.00	0.00	0.00	0.00
11.167	31.30	0.000	978.00	82.40	0.10	0.00	0.50	0.10	0.00	0.00	0.00	0.00
11.250	28.40	0.000	928.00	76.20	0.10	0.00	0.40	0.10	0.00	0.00	0.00	0.00
11.333	25.60	0.000	880.50	70.40	0.10	0.00	0.30	0.10	0.00	0.00	0.00	0.00
11.417	23.10	0.000	835.20	64.90	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00
11.500	20.70	0.000	792.00	59.80	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00
11.583	18.50	0.000	750.80	54.90	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00
11.667	16.50	0.000	711.60	50.40	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00
11.750	14.70	0.000	674.40	46.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00
11.833	13.10	0.000	639.10	41.90	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00
11.917	11.90	0.000	605.60	38.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00
12.000	10.70	0.000	574.00	34.30	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00

APPENDIX B: FLO-2D Summary Output

FLO-2D Summary Output (SUMMARY.OUT)

NEGATIVE VOLUME CONSERVATION (ACRE FEET)
INDICATES EXCESS VOLUME (OUTFLOW + STORAGE > INFLOW)

SIMULATION TIME (HOURS)	AVERAGE TIMESTEP (SECONDS)	VOLUME CONSERVATION (ACRE FEET)	PERCENT OF INFLOW

SUMMARY.OUT FILE
Pro Model - Build No. 20.07.22

1.000	1.077	-0.000000	0.000000
2.000	1.150	0.000000	0.000000
3.000	1.186	-0.000000	0.000000
4.000	1.211	0.000000	0.000000
5.000	1.230	-0.000000	0.000000
6.000	1.245	0.000000	0.000000
7.000	1.258	0.000000	0.000000
8.000	1.269	0.000000	0.000000
9.000	1.278	0.000000	0.000000
10.000	1.287	0.000000	0.000000
11.000	1.295	0.000000	0.000000
12.000	1.302	0.000000	0.000000
13.000	1.308	0.000000	0.000000
14.000	1.314	0.000000	0.000000
15.000	1.320	0.000000	0.000000
16.000	1.325	0.000000	0.000000
17.000	1.330	0.000000	0.000000
18.000	1.334	0.000000	0.000000
19.000	1.339	0.000000	0.000000
20.000	1.343	0.000000	0.000000
21.000	1.347	0.000000	0.000000
22.000	1.351	0.000000	0.000000
23.000	1.354	0.000000	0.000000
24.000	1.358	0.000000	0.000000

MASS BALANCE INFLOW - OUTFLOW VOLUME

*** INFLOW (ACRE-FEET) ***

	WATER
SURFACE WATER INFLOW HYDROGRAPH	7311.001

*** SURFACE OUTFLOW (ACRE-FT) ***

OVERLAND FLOW	WATER
FLOODPLAIN STORAGE	1145.002
FLOODPLAIN OUTFLOW HYDROGRAPH	6165.998
FLOODPLAIN OUTFLOW AND STORAGE	7311.001
TOL FLOODPLAIN STORAGE	157.396

*** TOTALS ***

TOTAL OUTFLOW FROM GRID SYSTEM 6165.998

TOTAL VOLUME OF OUTFLOW AND STORAGE 7311.001

SURFACE AREA OF INUNDATION REGARDLESS OF THE TIME OF OCCURRENCE:
(FOR FLOW DEPTHS GREATER THAN THE "TOL" VALUE TYPICALLY 0.1 FT OR 0.03 M)

THE MAXIMUM INUNDATED AREA IS: 18922.406 ACRES

THE MAXIMUM INUNDATED AREA (DEPTH > 0.5 FT) IS: 5417.183 ACRES

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GRID ELEMENT SIZE: 50.0 FT
TOTAL NUMBER OF GRID ELEMENTS: 1577481
GRID SYSTEM AREA: 90534.95 ACRES 141.4156 SQ. MI.

TOTAL FLOODPLAIN LOOP COMPUTATIONS: 37929175625.

NV5