1.0 INTRODUCTION The Bureau of Indian Affairs (BIA) is the lead Federal agency responsible for the National Environmental Policy Act (NEPA) process for the proposed Moapa Solar Energy Center (Moapa Solar Energy Center Project). The Bureau of Indian Affairs, in cooperation with the Moapa Band of Paiute Indians (Moapa Band of Paiute Indians), the Bureau of Land Management (BLM), the U.S. Environmental Protection Agency (EPA), the National Park Service (NPS), and the U.S.Fish and Wildlife Service (USFWS), as cooperating agencies, intend to prepare an environmental impact statement (EIS) for the proposed Moapa Solar Energy Center on the Moapa River Indian Reservation (Reservation) in Clark County, Nevada. The purpose of this report is to summarize issue areas raised by individuals, organizations, and agencies during the scoping comment period for the proposed Moapa Solar Energy Center on the Moapa River Indian Reservation in Clark County, Nevada. This report summarizes all comments received during the scoping period. The BIA will fully analyze the issues raised by these scoping comments and help shape the environmental analysis and alternatives to be considered in the draft EIS. The NEPA scoping process is designed to encourage involvement by all interested parties and to help agencies make better-informed decisions. 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 E of this report.

PROJECT DESCRIPTION

The Moapa Solar Energy Center would be located in Mount Diablo Meridian, Township 16 South, Range 64 East, Sections 30 and 31, Clark County, Nevada. For the purposes of this EIS, the "Analysis Area" will include an approximately 1,000-acre solar site and water pipeline entirely located on the Reservation. Corridors for the transmission interconnection and access road would be located on Federal lands managed by the BLM. The Moapa Solar Energy Center may include two solar technologies. One would be a photovoltaic (PV) solar project capable of producing up to 100 megawatts (MW) of power. The photovoltaic (PV) solar project would include up to 175,000 PV panels on single-axis tracking systems, inverters, and an operation and maintenance building. Construction of the photovoltaic (PV) solar project component is expected to take up to 12 months and is projected to have a life of 25 years. The second solar technology would be a concentrating solar power (CSP) project utilizing either eSolar's CSP plant technology or AREVA Solar's CSP technology. The eSolar technology consists of multiple 250-foot tall tower/receiver combinations situated between fields of heliostat mirrors. The focused solar heat boils water within the thermal receiver and produces steam that is aggregated and sent to a steam turbine to generate electricity. AREVA Solar's Compact Linear Fresnel Reflector uses modular flat reflectors to focus the sun's heat onto elevated receivers which consist of a system of tubes through which water flows. The concentrated sunlight boils the water in the tubes (at an approximate height of 80 feet), generating high-pressure superheated steam for direct use in power generation without the need for heat exchangers.

The water supply required for the concentrating solar power (CSP) project would be supplied by water leased from the Tribe and delivered to the concentrating solar power (CSP) project site via a water pipeline from one of the Tribe's production wells. The water pipeline will be located entirely on the reservation and will follow existing rights-of-way. Other major parts of the concentrating solar power (CSP) project would include an operation and maintenance facility building along with cooling towers and evaporation ponds. The concentrating solar power (CSP) project is expected to take 24 months to construct and expected to operate for approximately 25 to 30 years. An overhead 230 kilovolt (kV) transmission line would connect the solar energy center to the nearby Harry Allen 230 kV Substation approximately six miles from the concentrating solar power (CSP) project site. An additional 500 kV interconnection line could be constructed and connected to the Crystal Substation located approximately one mile east of the concentrating solar power (CSP) project boundary. An access road would be constructed to the Moapa Solar Energy Center site to provide access from the frontage road along the west side of Interstate-15 (I-15). This access road would be approximately 2.5 miles long and follows existing roads for much of its length.

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 Moapa Solar Energy Center and solicited comments from the public, landowners, Government agencies, tribes, and interested stakeholders. The BIA announced the proposed Moapa Solar Energy Center and scoping process through various means, held public scoping meetings, and invited the public to comment and ask questions. The proposed Moapa Solar Energy Center and public scoping meetings were publicized in the Federal Register, on the project website: http://www.moapasolarenergycentereis.com/, 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 proposed Moapa Solar Energy Center, announced the public scoping meetings, and outlined the ways to provide comments for the Moapa Solar Energy Center. The Notice of Intent (NOI) was published in the Federal Register on August 6, 2012. The Notice of Intent (NOI) can be found in Appendix A.\*\*PROJECT WEBSITE\*\*

A project website was established for access by anyone at any time during the EIS process. The project website provides project information and an opportunity to submit comments. The project website will remain active for the duration of the EIS process and can be accessed at http://www.moapasolarenergycentereis.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 project area and project location maps. Over 75 scoping letters were mailed on August 7, 2012. The scoping letter with attached maps and the project mailing list can be found in Appendix B.

\*\*NEWSPAPER ADVERTISEMENTS\*\*

A public notice/news release was published in three local newspapers on August 8, 2012. The publications included:

- Las Vegas Review Journal

- Las Vegas Sun

- Moapa Valley Progress

Copies of the published public notice/news release 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. Paul Schlafly, Natural Resource Specialist, BIA, Southern Paiute Agency, 180 North 200 East Suite 111, P.O. Box 720, St George, Utah, 84770; or to Ms. Amy Heuslein, Regional Environmental Protection Officer, BIA Western Regional Office, 2600 North Central Avenue, 4th Floor Mailroom, Phoenix, AZ 85004.

- Comments could be submitted via the "submit comment" tab on the project website at http://www.moapasolarenergycentereis.com/

- Comments could be provided via email or phone to either Mr. Paul Schlafly, at paul.schlafly@bia.gov; telephone: (435) 674-9720 or Ms. Amy Heuslein, at amy.heuslein@bia.gov; telephone: (602) 379-6750

- Comments could be provided at the public meetings either orally or by filling out a comment form provided at the meetings (that could be handed in at the meeting or mailed in at a later date). A copy of the comment form is provided in Appendix C. See below for the details of the scoping meetings.

\*\*3.0 PUBLIC SCOPING MEETINGS\*\*

The BIA hosted public information and scoping meetings in Moapa Town on the reservation and in Las Vegas at the BLM office to provide NEPA process and proposed project information and gather public comments. The two public scoping meetings were held at the times and locations listed below.

Meeting Date and Time | City/State/Zip Code | Address | Attendance

---|---|---|---

August 21, 2012 | Moapa Town, NV 89025 | Moapa River Indian Reservation Tribal Hall, One Lincoln Street | 40

August 22, 2012 | Las Vegas, NV 89130 | BLM Conference Room, Southern Nevada District Office, 4701 North Torrey Pines Drive | 29

TOTAL ATTENDANCE | | | 69

The public scoping meetings were a combination of an open house and formal presentation. Attendees were greeted at the entrance and asked to sign in. Handouts were available for the public, and posters were on display that described the project and NEPA process. Attendees were able to ask questions to the agency and project representatives while viewing posters.

\*\*HAND-OUTS\*\*

The following handouts were available at the public meetings:

- 8 1/2" by 11" color project area map

- Public scoping letter

- Comment form

The handouts available at meetings can be found in Appendix C.

\*\*PRESENTATION\*\*

Following an open house of approximately 30 minutes, a formal presentation was provided. Both scoping meetings followed the same agenda, with the exception of an opening prayer that was conducted at the Moapa River Indian Reservation by Mr. Leroy Spotted Eagle and introductory remarks at the BLM office in Las Vegas by Ms. Brenda Wilhight, BLM Realty Specialist. The program opened with Chairman Mr. William Anderson of the Moapa Band of Paiute Indians providing a brief history of the Reservation, what Chairman Mr. William Anderson envisions will be the future of the Paiute people and the importance of the Proposed Action to the community of Paiute Indians. Ms. Kellie Youngbear, BIA Superintendent for the Southern Paiute Agency, introduced herself and Southern Paiute Agency staff.Following Ms. Youngbear, Ms. Amy Heuslein, BIA Regional Environmental Protection Officer, introduced Bureau of Indian Affairs and Bureau of Land Management staff and explained the various ways to provide comments. Moapa Solar Energy Center Scoping Report October 2012" Ms. Amy Heuslein gave a presentation explaining the purpose and need of the Environmental Impact Statement, Environmental Impact Statement schedule, and the National Environmental Policy Act process. Mr. Randy Schroeder of the Environmental Impact Statement consultant team then presented the Proposed Action with an overview of the technical aspects and the environmental issues already identified to be addressed in the Draft Environmental Impact Statement. Following the presentation, the attendees were invited to provide verbal comments or ask questions about the Proposed Action. A court reporter was present at the Moapa meeting and detailed notes were taken at the Las Vegas meeting to record the public comments expressed. The scoping meeting presentation, transcripts, and public meeting summaries are provided in Appendix C.

INFORMATION STATIONS

Both public meetings included the following posters/stations: How to Participate, Areva Solar Concentrated Solar Power Technology, Proposed Action, eSolar Concentrated Solar Power Technology, NEPA Process/Schedule, Photovoltaic Technology, Involved Agencies, Associated Project Facilities, Overall Project Description, Photovoltaic Solar Project Conceptual Site Layout, Concentrated Solar Power and Photovoltaic Solar Project Conceptual Site Layout. Display boards presented at these stations are included in Appendix E. Moapa Solar Energy Center Scoping Report October 2012

COMMENT EVALUATION COMMENTS RECEIVED

The scoping period began on August 6, 2012, the date the Notice of Intent was published in the Federal Register. In addition to comments received at the two scoping meetings, there were 12 comment letters/forms received through a variety of means (see "Methods for Submitting Comments" for more details). All comments were reviewed and categorized. Copies of all comments and their categorization are contained in Appendix E.

PROCESSING COMMENTS

Each comment letter was read to identify key issues and code those key issues. Commenter contact information and coded comments were recorded. In some cases, a single comment document contained multiple comments that were identified using a coding system that corresponded to resource/issue categories. Appendix D contains the coding categories used.

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 Environmental Impact Statement. Moapa Solar Energy Center Scoping Report October 2012

COMMENT RESULTS PER RESOURCE TOPIC

The following sections organize the comments received by resource and issue categories. Each coded individual comment letter/form showing the individual comments is shown in Appendix E. PURPOSE AND NEED

- The project should not move forward unless a better substantiation of purpose of need is provided.

- Given that the power from the nearby K Road Moapa facility has yet to be purchased, the public statements from Nevada Energy that Nevada Energy is not interested in purchasing any more renewable energy at this time, and statements from California that California only wants to purchase from in-state resources, the entire purpose and need for this project is in doubt.

- When is the Power Purchase Agreement going to be in place? The project sounds speculative.

ALTERNATIVES

- Consider assessing a hybrid-wet/dry cooling and dry-cooling alternatives when deciding on technology.

- Include the exact number of Concentrated Solar Power towers proposed to be built.

- Include a cost/benefit analysis in the alternatives evaluation.

- Explain why two alternatives are being considered and analyzed, but only one transmission line will be built.

- Alternatives to dredge or fill materials discharged into the waters of the U.S. should be discussed.

- Since impacts on biological resources vary between the different solar energy technologies, recommend determining the technology prior to the Record of Decision to avoid impacts to biological resources.

- A range of meaningful alternatives should be explored.

- Consider alternatives to avoid desert tortoise habitat.

CLIMATE

- Address additive impacts from climate change on resources affected by the project, including impacts that the project will have on desert tortoise habitat and habitat linkages, carbon sequestration from the loss of desert vegetation and soil disruption.

- Identify in the planning documents measures to avoid significant adverse impacts that will change the landscape and negatively add to climate change.

- Document the significant benefits from reduced greenhouse gas emissions from the proposed project as the significant benefits compare to energy production associated with fossil fuels.

WATER RESOURCES

- How much groundwater is required for Photovoltaic and Concentrated Solar Power?

- Where would the water be drawn from - the river or a well?

- Minimize water use over project life.

- Avoid placement of heliostats in desert washes.

- Commit to use natural washes for flood control.

- Concern regarding impacts of groundwater usage.\*\*WATER CONSERVATION\*\* Consider the benefits of photovoltaic (PV) technology with regard to water conservation. The effects of evaporation ponds associated with concentrating solar power (CSP) technology need to be evaluated. Identify the quantity of water required during the construction and operation processes, describe the source of the water, effects on other users, impacts to groundwater recharge, and other water bodies and biological resources. Discuss the potential for subsidence. The potential for water recycling and the use of xeric plants for landscaping should be addressed. Discuss climate change effects on water quantity. Address the effect of the project discharges on water quality. Water sustainability must be one of the guiding principles for siting solar energy development. Solar energy development should not contribute to exceeding the sustainable yield of the surface or groundwater source to avoid injury to special status species and their habitat. The Moapa Solar Energy Center project may be subject to permitting by the Nevada Division of Environmental Protection, Bureau of Water Pollution Control (BWPC), associated with any of Moapa Solar Energy Center project's discharges - including, but not limited to, well development, wastewater, DeMinimis, Underground Injection Control (UIC), and domestic sewage discharges. Other entities who may have an interest in the water in the area, such as the U.S. Fish and Wildlife Service (USFWS), Southern Nevada Water Authority (SNWA), and Muddy Valley Irrigation Company (MVIC), could have an issue down the road regarding the amount of water that is needed for the Moapa Solar Energy Center project. A stringent water usage plan and water monitoring plan should be incorporated in the planning documents to take into account future projects that may be proposed for the area and have additional water usage requirements.

\*\*AIR QUALITY\*\* Provide a detailed discussion of ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS) and nonattainment areas, and potential air quality impacts of the Moapa Solar Energy Center project, including cumulative and indirect impacts for each fully evaluated alternative. Mitigation measures should include multiple techniques to combat potential fugitive dust situations that may occur during both the Moapa Solar Energy Center project's construction and operation. Emissions should be estimated for the construction phase, as well as for the operational phase from maintenance activities and ancillary operations. Construction-related mitigation measures should be discussed.

\*\*BIOLOGICAL RESOURCES\*\* Desert Tortoise: Avoid and minimize unavoidable impacts to desert tortoise habitat. Any proposed translocation of desert tortoises must be accompanied by specific monitoring or research to study the success of these efforts. Will the desert tortoise need to be relocated or allowed to stay in the area? Authorization by the State of Nevada is required in addition to any Federal authorizations for relocation/removal of desert tortoises. It is increasingly difficult to find intact, high-quality desert tortoise habitat in private ownership that could be purchased and conserved to provide some mitigation for the loss of other occupied desert tortoise habitat in the Northeastern Mojave Recovery Unit, such as the lands proposed for this solar plant. Address whether as part of the preparation of the site for solar energy development, mass grading and leveling would be required, which would destroy tortoise habitats and render these tortoise habitats unsuitable in perpetuity. Concern exists that even if mass grading were not done, the desert tortoise habitat would be significantly degraded. There is concern that the proposed project may increase new sites for perches and nests for the common raven (Corvus corax), a known predator of juvenile desert tortoises. It is recommended that non-lattice structures be considered for power lines because non-lattice structures afford less perching, roosting, and nesting locations for ravens. Address potential impacts to Mojave desert tortoises (Gopherus agassizii) and the Moapa dace (Moapa coriacea), and their habitats. There is a concern that the Moapa dace may be impacted by groundwater withdrawal required for the Moapa Solar Energy Center project. The USFWS's Biological Opinion should be included as an appendix to the Environmental Impact Statement (EIS). Analysis of impacts and mitigation on listed species should include: baseline conditions of habitats and populations of the covered species, a clear description of how avoidance, mitigation, and conservation measures will protect and encourage the recovery of the covered species and their habitats in the project area, and monitoring, reporting, and adaptive management efforts to ensure species and habitat conservation effectiveness. Include maps and descriptions of all waters of the United States potentially affected by the alternatives. Demonstrate the alternatives' compliance with the Clean Water Act 404(b)(1) guidelines. Recommend analysis of possible project impacts to federally listed species, state-protected species, and migratory birds. Discuss potential impacts of construction, installation, and maintenance activities on habitat and species. Discuss the impacts associated with an increase of shade in the desert environment on vegetation and species and impacts associated with constructing fences around the project site. Recommend multi-year avian surveys. Practices that preserve vegetation and habitat, minimize weed invasion, and prevent erosion should be incorporated into the Moapa Solar Energy Center project.Certainly, here's the revised text with pronouns resolved:

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Describe how the project will meet the requirements of Executive Order 13112 and include an invasive plant management plan for the monitoring and control of noxious weeds. Include mitigation measures for desert tortoise and other wildlife considered avian prey. Consider innovative construction techniques that leave vegetation and wildlife habitat in place under photovoltaic panels and heliostats to reduce construction and maintenance costs by minimizing water erosion, reducing airborne dust, preventing weed invasion, and hastening reclamation. The Gila monster is known to occur within the geographic area, thus recommend evaluation of project impacts to any existing populations and suitable habitat for the Gila monster.

Concern that project-related activities could facilitate the incursion and/or spread of non-native, invasive plants. The spread of invasive species is known to alter fire ecology of the Mojave Desert and increase wildfire frequency. Develop a vegetation plan describing how sensitive or state-listed plants will be avoided, salvaged, and made available for restoration or compensated for. Avoidance of sensitive and state-listed plants should be taken into account when developing the project footprint and the layout of solar infrastructure should be sited and arranged to avoid impacting sensitive or state-listed plants. Plant surveys should be conducted for state protected cacti and yuccas, stick ringstem, Beaverdam breadroot, three-corner milkvetch, Las Vegas buckwheat, sticky buckwheat, rosy two-toned penstemon, and white bearpoppy during spring flowering periods and any plant locations found should be geospatially mapped. At least two years of plant surveys should be conducted to confirm the absence of sensitive or state-listed plants, and if sensitive or state-listed plants are found to be present, protective measures should be established to avoid, minimize, and mitigate impacts.

Land clearing or other surface disturbance associated with the proposed project should be conducted outside the avian breeding and nesting season which occurs approximately between March 1 and July 31. If conducting land clearing or other surface disturbance outside the avian breeding and nesting season is not feasible, it is recommended that a qualified biologist survey the area prior to land clearing. If burrowing owls are determined through surveys to occur within the project, the project should be designed to avoid disturbing burrows that are used by burrowing owls. Concerns about the potential impacts to raptors, including eagles and other migratory birds, from loss of foraging habitat, transmission line strikes, and power towers. It is recommended that pre-project surveys be conducted for raptors, including eagles, and other migratory birds, and to develop a Bird and Bat Conservation Strategy and an Eagle Conservation Plan. Holes, gaps, or hollow spaces in the proposed facilities or structures should be closed during construction to prevent bird entry. When the Biological Assessment (BA) is prepared and the Bureau of Indian Affairs (BIA) requests consultation, the project design or proposed action should be near final with a preferred alternative that includes a single footprint, proposed methods, and technologies.

SOCIOECONOMICS

When will any project-related jobs be available? Tribal Employment Rights requires availability of jobs for Native Americans. Moapa Solar Energy Center Scoping Report October 2012

How are independent contractors on Indian land selected to ensure construction/inspection is done correctly and Indian investments are protected? Ensure the project leads to training and employment opportunities including the creation of long-term jobs in the electricity and natural resources sectors for the Moapa Band of Paiute Indians. Care should be taken to protect other users of common corridors.

LAND/RESOURCE USE/VEGETATION

Will the new transmission lines be located in existing transmission corridors? As utility corridor crossings are determined as part of the proposed project, enough space should be identified to allow utility corridor crossings be as near to right angles as possible to separate transmission lines so interference is minimized and the possibility of construction damage is minimized.

MILITARY USE

The proposed project is under the primary route used by military aircraft to enter and exit the Nevada Test and Training Range (NTTR) from Nellis Air Force Base (NAFB). The NTTR is a pristine military testing and training laboratory built on over 70 years of scientific research supporting military intelligence, arms, and radar advancement through the investment of an incalculable sum of Federal funding. The training and testing environment provided by the NTTR cannot be replicated. Nellis Air Force Base (NAFB) currently conducts approximately 50,000 over-flights per year in this area, which will increase to an estimated 63,000 flights following the bed-down of F-35 Joint Strike Fighter aircraft on NAFB. The area is located within the navigational aid flight path for approaching aircraft and is north of the controlled bailout area. Potential damage to the array may occur depending on the altitude and direction of the aircraft during an emergency ejection. Obstacles in this area are highly incompatible with flight operations and may present severe safety concerns.

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Note: Some pronouns were left unchanged as they were pleonastic or used for emphasizing the structure.o Thermal boundaries: Certain solar technologies release or emit extreme heat near and/or above solar technologies' development. The extreme heat may create a thermal boundary that requires aircraft to avoid the area in order to prevent aircraft buffeting, damage, or accidents. Further, heat-sensitive armament may create a severe safety hazard for aircrew and ground-based personnel in the area. Moapa Solar Energy Center Scoping Report October 2012 Page 5-7 o Glint/Glare: Depending on technology design features utilized, reflective glint and glare may create a severe safety hazard to pilots and aircraft, (including major force exercises such as RED FLAG and Weapons School Mission Employment Phase). o Cameras/security: Many solar technologies require the use of cameras for the targeting of mirrors on solar collectors. The use of high definition camera equipment in the region may present a security concern for joint and allied aircraft test and training operations. o Wireless systems: Electronic jamming on the NTTR is conducted on a regular basis. It is unknown how military operations could impact wirelessly controlled mirrors, or how disturbing the mirror alignment could create a glare hazard to flight crews or navigation. o Current Air Force regulations require pilots to avoid structures by 500 feet, so any technology rising above ground level (including PV arrays and solar towers) will place new and/or further restrictions on military operations in the area. Transmission lines (individually or through a cumulative effect) may create restrictions that adversely impact military testing and training capabilities depending on the location and/or quantity. CULTURAL RESOURCES The project location is about five miles west of the Congressionally-designated alignment of the Old Spanish National Historic Trail (NHT), co-administered by the NPS and BLM. Traditional Cultural Properties VISUAL RESOURCES How tall are the towers for both the PV and CSP? How tall are the transmission line poles? Will the transmission lines be located in existing transmission corridors? The construction of power towers in the vicinity of the Old Spanish Trail NHT is a concern for the NPS, and a photovoltaic only project is preferred. Where CSP technology is used, smaller towers with a height limit of 80 feet tall would be preferable. The use of photovoltaic technology or smaller power towers would minimize adverse impacts to the visual resources of the Old Spanish Trail NHT. NPS suggests the use of color palliatives to camouflage the scarring that may occur when cutting in new roads as a project design feature. Moapa Solar Energy Center Scoping Report October 2012 Page 5-8 HEALTH AND SAFETY Address potential direct, indirect, and cumulative impacts of waste generation, including hazardous waste, from project construction and operation. How tall are the towers for both the PV and CSP? How tall are the transmission line poles? The military will need latitude/longitude and Mean Sea Level/Above Ground Level (MSL/AGL) heights. Transmission lines (individually or cumulatively) may create restrictions that adversely impact military testing and training capabilities depending on the location and/or quantity. Alternative methods that minimize hazardous materials use should be evaluated. Multiple issues regarding potential hazards to air navigation were raised by the Air Force (summarized under the land use heading above). Concern over the mitigation of potential electrical current negatively affecting pipelines causing corrosion issues. CUMULATIVE What will be the cumulative effects of the groundwater usage? The Moapa Solar Energy Center and BLM Solar Energy Zone (SEZ) proposals would both affect the desert tortoise and other desert plant and wildlife species and are in the same overextended carbonate groundwater flow system, thereby potentially impacting the rare and imperiled species, including the Moapa dace and other rare desert fish and spring snails found in the Muddy River drainage. Describe the methodology used to assess cumulative impacts; the methodology developed jointly by EPA, the Federal Highway Administration, and the California Department of Transportation is recommended. Address cumulative impacts to water resources and the desert tortoise. Cumulative impacts should consider other projects proposed by BLM in the desert southwest. There is concern over the magnitude and severity of impacts from large-scale, disparate projects in this area which may have significant and unintended consequences on biological resources. In particular, potential widespread loss, degradation, or fragmentation of habitats due to direct, indirect, or cumulative effects of numerous large-scale renewable energy projects likely places listed species at a lower probability of recovery and increased risk of extirpations or extinction. Need to consider the cumulative impacts the Moapa Solar project will have, as well as K Road and other existing projects in the area. Moapa Solar Energy Center Scoping Report October 2012 Page 5-9 cent Where is the location of the K Road Solar project in relation to the Moapa Solar Energy Center project?In 2011, the Nevada State Legislature passed AB307 resulting in NRS 701.600 through 701.640 and creating the Energy Planning and Conservation Fund, and the Fund for Recovery of Costs. The chosen solar technology should be disclosed in the Draft EIS. What is the advantage of one technology versus the other - PV or CSP? How much power is required to pump the water needed for the solar panels? How much power will be generated and is power generation a certainty? Consider procuring PV components from a company that minimizes environmental impacts during production. Are there plans for supplemental power during the night? Where will the power go to....Nevada or California?

23 6.0 ISSUE SUMMARY This section provides a summary of the key issues identified by the comments provided during scoping for the Moapa Solar Energy Center Project. These issues will be the focus of the EIS analysis. PURPOSE AND NEED The Purpose and Need for the project needs to be well substantiated including the need to provide economic opportunity for the Tribe as well as meeting the renewable energy goals of the country and region. ALTERNATIVES A range of meaningful alternatives need to be developed including a dry-cooling and hybrid wet/dry cooling technology alternatives for the CSP technology with a corresponding cost/benefit analysis.

SENSITIVE WILDLIFE AND HABITATS Habitat loss or degradation and other impacts to sensitive species must be evaluated. The desert tortoise is the primary species of interest and the potential effect of groundwater withdrawal on the Moapa dace was also identified. Other species of interest are the gila monster, Burrowing Owls, Raptors including Eagles and other migratory birds.

VEGETATION The evaluation of vegetation impacts must include the potential effects on sensitive or protected plant species as well as the potential for the project to facilitate the introduction or spread of weeds.

WATER RESOURCE Potential hydrology impacts of groundwater usage particularly associated with the proposed CSP solar technology must be evaluated. Project variations or mitigations that would minimize water use over the project life need to be considered. Potential effects on water quantity must also be included.

CLIMATE CHANGE The potential impacts of the project on climate change must be evaluated.

AIR QUALITY An analysis of air quality impacts including estimates of emissions for both the construction and operational phases needs to be conducted for each alternative.

24 Page 6-2 SOCIOECONOMICS The potential socioeconomic effects of the project particularly on tribal members need to be evaluated. This must include a description of the training and employment available to the Moapa Band of Paiute Indians that would be provided by the project.

LAND/RESOURCE USE The potential impact of the project on the execution of military training activities conducted by Nellis Air Force Base in the area must be addressed. In addition, the location and land ownership of new transmission lines, water lines and access roads must be clarified.

VISUAL RESOURCES The visibility of the project from the Old Spanish National Historic Trail must be assessed to determine the potential impact to the trail.

CUMULATIVE IMPACTS The cumulative effect of the proposed project when combined with other projects in the area, need to be evaluated including specific attention to potential impacts to groundwater and sensitive biological resources. Waste and hazardous waste generation and management for the project must be clarified.

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25 7.0 NEXT STEPS The Bureau of Indian Affairs (BIA) will develop the draft EIS focusing on the identified issues, evaluating a range of reasonable alternatives, assessing potential impacts, and identifying possible mitigation measures. Once the draft EIS is complete, the Bureau of Indian Affairs will publicly circulate the draft EIS and host a public comment period. During this period, the Bureau of Indian Affairs will notify the public and hold public meetings. Public comments on the draft EIS will be responded to in the final EIS. The Bureau of Indian Affairs is committed to involving the public in the NEPA process. The Bureau of Indian Affairs anticipates providing periodic status updates and publishing all project documents on the project website: http://www.moapasolarenergycentereis.com/

26 APPENDIX D - CODING CATEGORIES DESCRIPTION Appendix C contains a listing of the issue category topics and assigned codes corresponding to each. 27 CODE CATEGORIES PN Purpose and Need ALT Alternatives CLI Climate WAT Water Resources AQ Air Quality CUL Cultural Resources BIO Biology Resources SOC Socioeconomics AQ Air Quality LAN Land/Resource Use HEA Health and Safety CUM Cumulative OTH Other

28 APPENDIX E - SCOPING COMMENTS RECEIVED This Appendix contains all scoping comments received.Each comment is identified by a document number and comments have been coded according to the coding list contained in Appendix D.

29 "Comment Reference Document 1 Bureau of Indian Affairs September 5, 2012 Western Regional Office, Branch of Environmental Quality Attn: Ms. Amy Heuslein 2600 North Central Avenue, 4th Floor Phoenix, AZ 85004-3008 Sent via e-mail: amy.heuslein@bia.gov RE: Scoping comments- Moapa Solar Energy Center Project Dear Ms. Heuslein: On behalf of the Center for Biological Diversity ("Center"), please accept this set of scoping comments regarding the Notice of Intent to prepare an Environmental Impact Statement ("EIS") for the Moapa Solar Energy Center Project ("MSEC"). The Center is a non-profit, public interest environmental organization dedicated to the protection of native species and the native species' habitats through science, policy, and environmental law. The Center has over 375,000 members and on-line activists throughout Nevada and the United States. The Center submits these comments on behalf of the Center's members, activists, staff, and members of the general public who are interested in protecting native species and the native species' habitats in Nevada and particularly those lands that would be impacted by the proposed action. The development of renewable energy is a critical component of efforts to reduce carbon pollution and climate-warming gases, avoid the worst consequences of global warming, and to assist in meeting needed emission reductions. The Center strongly supports the development of renewable energy production, and the generation of electricity from solar power, in particular. However, like any project, proposed solar power projects should be thoughtfully planned to minimize impacts to the environment. In particular, renewable energy projects should avoid impacts to sensitive species and habitat, and should be sited in proximity to the areas of electricity end-use in order to reduce the need for extensive new transmission corridors and the efficiency loss associated with extended energy transmission. Only by maintaining the highest environmental standards with regard to local impacts, and effects on species and habitat, can renewable energy production be truly sustainable. The Center is grateful for this opportunity to submit scoping comments to Ms. Amy Heuslein for Ms. Amy Heuslein's consideration in preparing the draft environmental impact statement for the Moapa Solar Energy Center Project. The Center presents the following initial comments addressing those issues and concerns for Ms. Amy Heuslein's consideration:"

30 "1. Uncertain and Speculative Nature of the Project. The Center is highly concerned about the approach to the environmental analysis being undertaken. At the scoping meeting held in Las Vegas on August 22, the proponent and then the Bureau of Indian Affairs stated that the technology to be used may not be determined until the time of the Record of Decision. This poses great difficulties in ascertaining the scope and nature of the environmental impacts and even in the Center identifying the Center's concerns with any specificity. It seems to the Center that this is a "fishing expedition" on the part of the proponent and highly speculative by the very nature of the approach. Given that the power from the nearby K Road Moapa facility has yet to be purchased, the public statements from Nevada Energy that Nevada Energy is not interested in purchasing any more renewable energy at this time, and statements from California that they only want to purchase from in-state resources, the entire purpose and need for the Moapa Solar Energy Center Project is in doubt. It is the Center's view that the NEPA for the Moapa Solar Energy Center Project should not advance until the proponent can better substantiate the stated purpose and need, and should the NEPA move forward, the draft EIS must disclose the chosen technology. 2. Impacts on desert tortoise. The desert tortoise is protected as Threatened under the Endangered Species Act. The desert tortoise is continuing to decline throughout its range despite being under federal and state Endangered Species Acts protection as threatened. The project area lies in the Northeastern Mojave Recovery Unit for the desert tortoise, within potential occupied habitat, and outside of areas designated as critical habitat. Typically, as part of the preparation of the site for solar energy development, mass grading and leveling would be required, that would destroy the desert tortoise habitat and render the desert tortoise habitat unsuitable in perpetuity. Even if mass grading were not done, the desert tortoise habitat would be significantly degraded. NEPA requires that a range of meaningful alternatives be explored in the environmental review process. 42 U.S.C. 4332(C)(iii),(E). The agency must "study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. 4332(2)(E); see also 40 C.F.R. 1502.14 (requires the EIS to examine all reasonable alternatives to the proposal).The Environmental Impact Statement (EIS) must address the impacts of this project and other linked projects to the survival and recovery of the desert tortoise in this recovery unit and take seriously the development of meaningful alternatives to this project that will avoid impacts to the desert tortoise and the species' habitat. As the Bureau of Indian Affairs (BIA) is aware, it is increasingly difficult to find intact, high-quality desert tortoise habitat in private ownership that could be purchased and conserved to provide some mitigation for the loss of other occupied desert tortoise habitat in the Northeastern Mojave Recovery Unit such as the lands proposed for this solar plant. Therefore, avoiding impacts to this essential habitat and maintaining the largest possible areas of intact, high-quality habitat is absolutely critical for the recovery of the species. The Draft Environmental Impact Statement (DEIS) must clearly address actions for avoiding, minimizing, and mitigating impacts to the desert tortoise and its habitat. The BIA must first look to ways to avoid impacts to the desert tortoise, for example, by identifying and analyzing alternative sites outside of tortoise occupied habitat, areas that have already been severely disturbed by prior land use, or by employing the alternative solar energy strategy of distributed power. The BIA must also look at ways to minimize any impacts that the BIA finds to be unavoidable, for example by requiring designs that minimize ground disturbances, limiting access roads, and provide for functional tortoise access across the site. Mitigation measures might include the acquisition of lands that would be perpetually managed for conservation or the funding of conservation management measures on federal lands or for tortoise research. The Scientific Advisory Committee (SAC) of the U.S. Fish and Wildlife Service's Desert Tortoise Recovery Office has recently concluded that translocation is fraught with long-term uncertainties, notwithstanding recent research showing short-term successes, and should not be considered lightly as a management option. When considered, translocation should be part of a strategic population augmentation program, targeted toward depleted populations in areas containing good habitat. The SAC recognizes that quantitative measures of habitat quality relative to desert tortoise demographics or population status currently do not exist, and a specific measure of depleted (e.g., ratio of dead to live tortoises in surveys of the potential translocation area) was not identified. Augmentations may also be useful to increase less depleted populations if the goal is to obtain a better demographic structure for long-term population persistence. Therefore, any translocations must be accompanied by specific monitoring or research to study the effectiveness or success of the translocation relative to changes in land use, management, or environmental conditions. Translocation should be used as a tool to augment populations within depleted recovery units, not as a mitigation strategy to allow for development in desert tortoise habitat. Obviously, since the K Road Moapa Solar Project has a federal nexus, consultation under the Endangered Species Act would be required. Such consultations must consider climate change impacts, including the need for maintaining habitat linkages between current and future desert tortoise habitat. The EIS must thoroughly disclose and analyze the impacts on the desert tortoise and its recovery and consider meaningful alternatives that would avoid significant impacts to the desert tortoise and other resources.

In light of unprecedented climate change, animal and plant species will attempt to adapt by expanding their ranges north and upslope to cooler conditions mimicking their current habitats, and abandoning their present no longer hospitable ranges.At a 2008 Desert Manager Group symposium entitled, "Climate and Deserts Workshop," Wayne Spencer of the Conservation Biology Institute gave a compelling lecture on this likely scenario in which Wayne Spencer called for the maintenance of broad ecological connectivity and the minimization of movement barriers to conserve species and ecological processes in the face of climate change. Such connectivity is not only important for the physical movement of species but perhaps more so for the conservation of genetic diversity and the prevention of genetic bottlenecks. At the same workshop, Kirsten Ironside presented on predicting climate change impacts. Kirsten Ironside presented historic data and modeling that suggests that species found abundantly in California and southern Nevada, such as Joshua tree, will be rare or eliminated from their current ranges and given the means will be extending northward into Nevada and Utah. The US Fish and Wildlife Service ("FWS") has indicated that the revised Dry Lake SEZ was situated in an area that provides habitat and genetic connectivity between areas with greater habitat suitability, particularly between the Mormon Mesa Critical Habitat Unit west of the SEZ and portions of greater habitat suitability north and east of the SEZ. The FWS identified the entire revised SEZ as priority connectivity habitat for the desert tortoise through a least-cost pathway model (Ashe 2012) based upon the USGS model for desert tortoise predicted suitable habitat (Nussear et al. 2009). Given the MSEC adjacency to the Dry Lake SEZ discussed above, the project site could impose a significant barrier to future movement and gene flow between populations within the Northeastern Mojave Recovery Area, as well as with populations in other recovery areas. The EIS must disclose and analyze the project's impacts on movement corridors and habitat connectivity, taking into account the heightened importance of such corridors in light of climate change. Cumulative and connected actions NEPA's implementing regulations state that agencies should consider similar, reasonably foreseeable actions together in the same environmental review document when the actions have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography, and the best way to assess adequately their combined impacts or reasonable alternatives is to consider them together. 40 C.F.R. 1508.25(a)(C). It is important for federal agencies to consider connected actions together in a single NEPA process as opposed to segmenting review. Daly v. Volpe, 514 F.2d 1106, 1110 (9th Cir. 1975) (where actions are interconnected in terms of fulfilling a joint purpose, it may be necessary to conduct a single NEPA review). Here, the BIA should coordinate this NEPA process with the approval process for all of the connected actions, including the transmission and water lines and substations that are proposed to serve this site. This coordination would allow all of the projects' significant impacts to be fully considered together. In particular, the BIA should consider together the additive impacts to biological resources, including the desert tortoise and the desert tortoise's habitat, from the proposed solar project and from the other proposed projects in the area to ensure that the true extent of impacts is fully disclosed and analyzed. BIA should not treat this critical analysis as a cumulative impacts question alone. Because the currently proposed projects are linked and interdependent, the projects should be evaluated together under NEPA. Most importantly, this project will have direct impacts on desert tortoise populations in the Northeastern Mojave Recovery Unit; around 2000 acres of desert tortoise habitat will be taken if the project is approved and permitted for development. BIA must look at those impacts in a comprehensive way that would allow BIA to formulate meaningful alternatives that could avoid many of the impacts of these linked projects and where impacts remain that cannot be avoided through alternatives, provide for comprehensive minimization and mitigation measures that will ensure that impacts to this recovery unit are appropriately mitigated. Ultimately, BIA must ensure that the approval of these linked projects does not impair the recovery of the desert tortoise populations in the Northeastern Mojave Recovery Unit. Groundwater: The project is within the Colorado River Hydrologic Basin, and more specifically, the project is in groundwater basin #216 - Dry Lake/Garnet Valley. The Garnet Valley groundwater basin is a basin-fill aquifer covering approximately 342,400 acres.The basin-fill aquifer consists of unconfined alluvium and lacustrine deposits of sand, silt, and clay, with an average thickness of around 600 ft. Regional-scale carbonate rock aquifers underlay the basin-fill aquifers in Garnet Valley. These carbonate rock aquifers are a part of the White River Groundwater Flow System (a subunit of the Colorado River groundwater system), a regional-scale groundwater system that generally flows southward and terminates at Muddy River Springs, Rogers and Blue Point Springs, and the Virgin River. The perennial yield for the basin-fill aquifer has been set at 400 ac-ft/yr by the State Engineer based on available data. In 2002, the State Engineer issued Order 1169 stating that new applications for water in the carbonate-rock aquifer systems within Garnet Valley would be suspended to allow further study of the groundwater system. Recent withdrawals of groundwater have ranged from 797-1558 ac-ft/yr; additionally, the Las Vegas Valley Water District has leased 2200 ac-ft/yr of Las Vegas Valley Water District's current water rights to dry-cooled power plants in Garnet Valley. An additional 44,500 ac-ft/yr (55 million m3/yr) of water rights have been applied for within Garnet Valley and are under consideration by the NDWR. Bureau for Land Management and Department of Energy. 2012. Final Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States. Vol 4, Chapter 11, page 11.3-17. Center for Biological Diversity Scoping Comments - Page 5 Notice of Intent for the Proposed K Road Moapa Solar Project

"Of particular concern regarding cumulative impacts is the proposal for a Bureau of Land Management (""BLM"") Solar Energy Zone (""SEZ"") adjacent to the proposed K Road Moapa Solar Project. The environmental compliance for the Solar Energy Zone is currently underway, and the Bureau of Land Management has released a draft environmental impact statement that proposes 5,717 acres be developed for solar energy production. The Moapa Solar Energy Center and Bureau of Land Management Solar Energy Zone proposals both are reasonably foreseeable and affect the desert tortoise and other desert plant and wildlife species and are in the same over-extended carbonate groundwater flow system, thereby potentially impacting the rare and imperiled species, including the Moapa dace and other rare desert fish and springsnails found in the Muddy River drainage. The cumulative effects analysis must take into account habitat destruction and water needs from all these proposed projects and disclose the impacts of these proposed projects on the desert environment and the plants and animals that inhabit the desert environment. Rare plant concerns: Plant surveys should be conducted for stick ringstem, Beaverdam breadroot, three-corner milkvetch, sticky buckwheat, rosy two-toned penstemon, and white bearpoppy during spring flowering periods and any found plant locations geospatially mapped. At least two years of plant surveys should be conducted to confirm the absence of the species and if the species is found to be present, protective measures should be established to avoid, minimize and mitigate impacts. The Center for Biological Diversity wishes to be an active stakeholder in this planning process and requests that the Center for Biological Diversity be added to any stakeholder notification list the Bureau of Indian Affairs may develop. Thank you for this opportunity to comment and the Center for Biological Diversity looks forward to other opportunities to provide review and input. Sincerely yours in conservation, Rob Mrowka, Ecologist and Nevada Conservation Advocate. Center for Biological Diversity Scoping Comments - Page 6 Notice of Intent for the Proposed K Road Moapa Solar Project."

"Comment Reference Document 2: Bureau of Indian Affairs Western Regional Office September 7, 2012 Branch of Environmental Quality Services Attn: Ms. Amy Heuslein 2600 North Center Ave, 4th Floor Mail Room Phoenix, AZ 85004-3008 Via E-mail: amy.heuslein@bia.gov With a copy to: paul.schafly@bia.gov Subject: Notice of Intent To Prepare an Environmental Impact Statement for the Moapa Solar Energy Center on the Moapa River Indian Reservation, Clark County NV. Dear Ms. Heuslein: Please accept these comments submitted on behalf of the Sierra Club (the ""Sierra Club"") on the Moapa Solar Energy Center (the ""Project""), a proposed 200 MW solar project on the Moapa River Indian Reservation (the ""Tribal Lands""). The Sierra Club is a national nonprofit organization of approximately 1.3 million members and supporters dedicated to exploring, enjoying, and protecting the wild places of the earth; to practicing and promoting the responsible use of the earth's ecosystems and resources; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives."The Sierra Club's concerns encompass protecting our public lands, wildlife, air, and water while at the same time rapidly increasing our use of renewable energy to reduce global warming. The Sierra Club submits these comments on behalf of the Sierra Club's members, activists, staff, and members of the general public who are interested in protecting native species and native species' habitats as well as supporting the development of clean, renewable sources of electrical energy. The development of renewable energy is a critical component of efforts to reduce carbon pollution and climate-warming gases, avoid the worst consequences of global warming, and to assist in meeting needed emission reductions. The Sierra Club strongly supports the development of renewable energy production, and the generation of electricity from solar power, in particular.

The Moapa Band of Pauite Indians (the "Moapa") and the Southern Nevada Group of the Sierra Club have worked together for years to retire the Reid Gardner coal-fired power plant ("Reid Gardner"), which emits more than 4,000 tons of nitrogen oxides, more than 1,200 tons of sulfur dioxide, and more than five million tons of carbon pollution each year. Reid Gardner is located just a few hundred yards from the Tribal Lands and Reid Gardner is a major source of air pollutants and particulate matter—causing well-documented serious respiratory and other health problems amongst those living on Tribal Lands. The Tribal Lands are located within airshed region H-218 (California Wash), which is a non-attainment area for ozone emissions. Electricity production from the Project will not cause emissions, and the Project is anticipated to have a positive effect on climate change. The Sierra Club and the Moapa see the Project as a means to illustrate that developing clean, renewable, and cost-effective sources of electrical energy in Nevada is possible. For the above reasons, the Sierra Club encourages the development of a solar power project on the Tribal Lands. However, like any project, solar power projects should be thoughtfully planned to minimize impacts to natural resources. Based on information provided at the public scoping meeting for the Project held at the Las Vegas Bureau of Land Management (BLM) office on August 22, 2012 (the "Scoping Meeting"), and the Sierra Club's experience working on natural resource issues in Southern Nevada, the Sierra Club offers the following recommendations for your consideration.

Training and Employment Programs

The Sierra Club views the Project as an opportunity for the Moapa to gain valuable long-term economic opportunities. The developer of the recently approved K Road Moapa Solar Project worked with the Moapa and local labor partners to develop a training program for tribal workers. The Sierra Club encourages the project proponent to engage in similar efforts to create long-term jobs in the electricity and natural resources sectors. The Sierra Club encourages the Bureau of Indian Affairs (BIA) and the project proponent to ensure that the Project leads to training and employment opportunities for the Moapa.

Water Issues

Water sustainability must be one of the guiding principles for sitting solar energy development. The Sierra Club finds it critical that solar energy development should not contribute to exceeding the sustainable yield of the surface or groundwater source to avoid injury to special status species and their habitat. For these reasons, the Sierra Club does not support the use of wet-cooled concentrated solar technology in areas (such as Clark County, Nevada) with serious water resource constraints, particularly when the impacts to sensitive and threatened species on an individual or ecosystem level may be very high. In particular, the Sierra Club is concerned regarding the impacts of groundwater usage. This focus on wet-cooled technology is particularly surprising in light of both the widespread availability of technologies which do not pose such risks, and an industry-wide shift towards such technologies. Cooling systems such as dry cooling and hybrid cooling can conserve water in the cooling cycle, and concentrating PV can conserve even more water because no cooling cycle is needed. The Sierra Club recommends that the project proponent and the BIA fully consider the benefits of both dry-cooled concentrated solar and photovoltaic technologies.

Technology

The Sierra Club is also concerned that the technology for this Project is not yet determined, and based on statements made at the Scoping Meeting, may not be determined until the Record of Decision (ROD) for the Project is issued. The impacts on biological resources are highly variable between different solar energy technologies. Determining technology early in the development process allows the developer to site the solar project to avoid impacts to biological resources and to develop a robust and effective mitigation strategy.\*\*Desert Tortoise\*\*

The desert tortoise Mojave Desert population has been provided protection under the Endangered Species Act ("ESA") as a threatened species since 1990. A plan to recover and conserve the desert tortoise Mojave Desert population was formalized in 1994, and in May of 2011 was revised to incorporate new information and science. The Project is within the revised Northeastern Recovery Unit. We strongly recommend robust and comprehensive desert tortoise surveys are conducted, and effective avoidance, minimization and mitigation measures are implemented.

\*\*Rare Plant Surveys.\*\* Plant surveys should be conducted for Las Vegas buckwheat and various state-protected cacti and yuccas, Beaverdam breadroot, three-corner milkvetch, sticky buckwheat, rosy twotoned penstemon and white bearpoppy during spring flowering periods and any found plant locations geospatially mapped. The Proponent should develop a comprehensive vegetation plan describing how sensitive or state-listed plants will be avoided, salvaged and made available for restoration or compensated for. Avoidance of sensitive and state-listed plants should be taken into account when developing the Project footprint and layout, and solar infrastructure should be sited and arranged to avoid impacting such plants.

\*\*Avian Species\*\* The impacts of solar power tower technology on sensitive avian and bat species are still unknown, but potentially significant. Golden eagles are likely present on the site on an irregular basis as golden eagles utilize the area for foraging, and there may be potential for take. Other species of birds, most if not all protected under the Migratory Bird Treaty Act, may be present on the site and could be adversely impacted by the development of a power tower technology on the site. For this reason, we encourage the developer and the BIA to conduct multi-year avian surveys, and to create a comprehensive and robust strategy for avoiding impacts to sensitive avian species.

We thank you for the opportunity to provide scoping comments on the Project and to participate in the successful development of the Project as interested stakeholders. We look forward to working with the project proponent, the Moapa and the BIA to successfully develop a viable, sustainable project with minimal impacts to natural resources.

Sierra Club

cc: paul.schafly@bia.gov

\*\*General Comments\*\* Nellis Air Force Base (NAFB), located to the southwest of the site, maintains a major military airfield from which nearly 50,000 DoD and allied aircraft departures and arrivals occur annually. The proposed project is under the primary route used by military aircraft to enter and exit the Nevada Test and Training Range (NTTR) from NAFB.This complex represents almost 40% of the Air Force's land assets, 10% of Department of Defense's land assets, and is an irreplaceable national security asset and supports every aircraft type in the Department of Defense inventory. Joint and allied partners conduct several highly specialized flying and ground combat testing and training missions on the complex in preparation for real-world joint combat operations worldwide. The Nevada Test and Training Range (NTTR) is a pristine military testing and training laboratory built on over 70 years of scientific research supporting military intelligence, arms, and radar advancement through the investment of an incalculable sum of federal funding. The training and testing environment provided by the NTTR cannot be replicated. Solar development in this area may present mission impacts to military operations in the region, as outlined below. However, specific technology information and site plans are necessary in order to effectively determine the level of military mission impacts.

1) Nellis Air Force Base (NAFB) currently conducts approximately 50,000 over-flights per year in this area, which will increase to an estimated 63,000 flights following the beddown of F-35 Joint Strike Fighter aircraft on Nellis Air Force Base. Current Air Force regulations require pilots to avoid structures by 500 feet, so any technology rising above ground level (including photovoltaic arrays and solar towers) will place new and/or further restrictions on military operations in the area. The area is located within the navigational aid flight path for approaching aircraft and is north of the controlled bailout area. Potential damage to the array may occur depending on the altitude and direction of the aircraft during an emergency ejection. Obstacles in this area are highly incompatible with flight operations and may present severe safety concerns.

2) Transmission lines: The need for multiple, interconnected transmission lines to transport power from the proposed site to demand centers/marketplace may negatively impact airspace through increased altitude restrictions in low-level flight corridors and Military Operating Areas (MOAs). Transmission lines (individually or through a cumulative effect) may create restrictions that adversely impact military testing and training capabilities depending on the location and/or quantity.

3) Thermal boundaries: Certain solar technologies release or emit extreme heat near and/or above their development. The extreme heat may create a thermal boundary that requires aircraft to avoid the area in order to prevent aircraft buffeting, damage, or accidents. Further, heat-sensitive armament may create a severe safety hazard for aircrew and ground-based personnel in the area.

4) Glint/Glare: Depending on technology design features utilized, reflective glint and glare may create a severe safety hazard to pilots and aircraft, including major force exercises such as RED FLAG and Weapons School Mission Employment Phase.

5) Cameras/security: Many solar technologies require the use of cameras for the targeting of mirrors on solar collectors. The use of high-definition camera equipment in the region may present a security concern for joint and allied aircraft test and training operations.

6) Wireless systems: Electronic jamming on the NTTR is conducted on a regular basis. It is unknown how military operations could impact wirelessly controlled mirrors or how disturbing the mirror alignment could create a glare hazard to flight crews or navigation.

REVIEW COMMENTS: Moapa Reservation K Road Energy Project Reviewer: Nellis Air Force Base Office Symbol: Contact Number: 702 652-9366

1. General 57 WG/SEF The proposed location is on the north end of the controlled bailout (ejection) area. This development poses a risk to solar equipment from falling aircraft debris (or the aircraft itself), as well as a potential risk to aircrew descending in parachutes (depending on the winds).

2. General 57 WG/SEF A field of shiny solar arrays reflecting sunlight poses a legitimate concern for aircraft in the vicinity since Dry Lake is along the approach/recovery corridor to the east side of the Nevada Test and Training Range. Dry Lake is also a common holding point for emergency aircraft prior to landing.

3. General Rob Brabant - 57 Will need latitude/longitude and mean sea level/above ground level heights to look at the issue.

4. General James Callahan - We want to know how high the power lines will be and which alternative energy methods will be used. After the meeting, those answers were not available but the team will continue to pursue them in the future.General James Callahan - General James Callahan will need the height of any structures and need to know if 57 OSS/OSM they will be lighted. 57 OSS/OSM stated 57 OSS/OSM MAY use one, or a combination of two, types of solar facilities. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 51 # Page Line/Para./Sec Reviewer Comment Response 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 52 PUBLIC COMMENT FORM Bureau of Indian Affairs MOAPA SOLAR ENERGY CENTER PROJECT www.MoapaSolarEnergyCenterElS.com Scoping Comments NAME: ADDRESS: b oZc, (3. ^ r Arz.^\*- () I have no comments, please keep me informed. () Please remove me from your mailing list for this Project. ()0 I have the following comments about the Moapa Solar Energy Center Project: -fht^h v,r,^. I Return to: Ms. Amy Heuslein, Regional Environmental Protection Officer, BIA Western Regional Office, 2600 North Central Avenue, 4th Floor Mailroom, Phoenix, AZ 85004 Email: amy.heuslein@bia.gov (Or fold, seal, and add a stamp to the back of the sheet). 53 Comment Reference Document 6 September 16, 2012 Bureau of Indian Affairs Western Regional Office, Branch of Environmental Quality Attn. Ms. Amy Heuslein 2600 North Central Avenue, 4th Floor Phoenix AZ 85004-3008 Sent via e-mail: amy.heuslein@bia.gov RE: EIS Scoping comments for Moapa Solar Energy Center Project Dear Ms. Heuslein, Ms. Hermi D. Hiatt is receiving these scoping comments past the due date because Ms. Hermi D. Hiatt did not receive notification of the scoping meetings until September 6, 2012. Ms. Hermi D. Hiatt would appreciate receiving further notices in a more timely matter. It is not easy to comment on a project where the proposed technology and hence the impact on such resources as groundwater is yet unknown. Impacts on other environmental resources such as the desert tortoise, rare plants, and the banded Gila Monster cannot be determined without more information. As a plant ecologist Ms. Hermi D. Hiatt is very familiar with this area. Ms. Hermi D. Hiatt has conducted rare plant surveys in the areas of both transmission line options, all on Bureau of Land Management (BLM) lands, and also assisted the tortoise biologists with plant identification within the project site. A number of rare plants and plants of concern to the BLM were found, and also several species of cacti. Threecorner milkvetch, a State of Nevada Critically Endangered Species and a Federal Species of Concern may occur in the project site. Since this species does not germinate every year, further plant surveys may be needed before this project gets approved. Incidentally, the fact that tortoise surveys and plant surveys were performed in 2010 was not acknowledged during the scoping meetings. That information should have been available to the attendees of these meetings. Sincerely, Hermi D. Hiatt Biological Consultant 8180 Placid Street Las Vegas, NV 89123 cc: Paul Schlafly 54 Comment Reference Document 7 Skip Canfield From: Rebecca Palmer Sent: Tuesday, September 04, 2012 9:56 AM To: Skip Canfield Subject: RE: Nevada State Clearinghouse Notice E2013-031 The SHPO supports this document as written.Rebecca Lynn Palmer, Deputy Historic Preservation Officer, 901 South Stewart Street, Suite 5004, Carson City, NV 89701. Phone (775) 684-3443, Fax (775) 684-3442. Please note, Rebecca Lynn Palmer's email is rlpalmer@shpo.nv.gov.

From: scanfield@lands.nv.gov [mailto:scanfield@lands.nv.gov]

Sent: Monday, August 13, 2012 1:40 PM

To: Alan Coyner; Alan Jenne; Alisanne Maffei; clytle@lincolnnv.com; Brad Hardenbrook; ddavis@unr.edu; dmouat@dri.edu; Edward Foster; ed.rybold@navy.mil; gderks@dps.state.nv.us; James Morefield; Jason Woodruff; Jennifer Newmark; Jennifer Scanland; munteanj@unr.edu; jprice@unr.edu; kirk.bausman@us.army.mil; cohnl@nv.doe.gov; Lowell Price; Mark Freese; Mark Harris; Mike Dondero; deborah.macneill@nellis.af.mil; escomm2@citlink.net; Octavious.Hill@nellis.af.mil; Pete Anderson; Pete Konesky; Rebecca Palmer; Rich Harvey; Robert K. Martinez; Sandy Quilici; Sherry Rupert; Steven Siegel; tcompton@dot.state.nv.us; Terry Rubald; Richard Ewell; tmueller@dot.state.nv.us; Tod.oppenborn@nellis.af.mil; William.Cadwallader@nellis.af.mil; zip.upham@navy.mil; Joe Strolin; Alex Lanza; Dave Marlow; Michael Visher; Kevin J. Hill; dziegler@lcb.state.nv.us; Richard A. Wiggins; Robert Gregg; Shimi.Mathew@nellis.af.mil; Skip Canfield; whenderson@nvnaco.org; Tim Rubald; djohnston@dps.state.nv.us; John Walker; Karen Beckley; Russ Land; Cliff Lawson; mstewart@lcb.state.nv.us; sscholley@lcb.state.nv.us; Jennifer Crandell; Madams@ag.nv.gov; McClain Peterson; WHowle@ag.nv.gov

Follow the link below to find information concerning the above-mentioned project for the recipients' review and comment.

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55 E2013-031 - http://clearinghouse.nv.gov/public/Notice/2013/E2013-031.pdf

Please evaluate this project's effects on each agency's plans and programs and any other issues that the recipients are aware of that might be pertinent to applicable laws and regulations. Please reply directly from this e-mail and attach the recipients' comments. Please submit their comments no later than Tuesday, September 4th, 2012.

Clearinghouse project archive Questions? Skip Canfield, Program Manager, (775) 684-2723 or nevadaclearinghouse@lands.nv.gov

\_\_\_\_No comment on this project

\_\_\_\_Proposal supported as written

AGENCY COMMENTS:

Signature:

Date:

Requested By:

Distribution:

- Division of Emergency Management Alan Coyner

- Commission on Minerals Alan Jenne

- Department of Wildlife, Elko Alex Lanza

- Alisanne Maffei

- Department of Administration Cliff Lawson

- Nevada Division of Environmental Protection Cory Lytle

- Lincoln County D. Bradford Hardenbrook

- Department of Wildlife, Las Vegas Dave Marlow

- Dave Ziegler

- LCB David David

- UNR Bureau of Mines David Mouat

- Desert Research Institute

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56 "Comment Reference Document 8 Ms. Amy Heuslein, Regional Environmental Protection Officer, BIA Western Regional Office, 2600 North Central Avenue, 4th Floor Mailroom, Phoenix, AZ 85004

RE: Notice of Intent To Prepare an Environmental Impact Statement for the Moapa Solar Energy Center on the Moapa River Indian Reservation, Clark County NV

Dear Ms. Heuslein:

The National Park Service (NPS) appreciates the opportunity to provide comments regarding the above-stated Notice of Intent. The National Park Service supports renewable energy projects so long as such projects can be constructed and operated in an environmentally responsible manner that serves the public interest, protects natural resources, and protects the National Park Service's treasured landscapes.It is the role of the National Park Service (NPS) to contribute to the process and the analysis of renewable energy projects to help ensure that such projects are "Smart from the Start." As a cooperating agency, the goal of the National Park Service is to provide both positive and practical feedback in order to mitigate potential impacts to the resources of National Park units in the vicinity. After review of the proposed project and project location, the National Park Service would like to submit the following comments: The National Park Service National Trails Intermountain Region office has reviewed the proposed location of the Moapa Solar Energy Center (MSEC) on the Moapa River Indian Reservation, in Clark County, Nevada. The location is about five miles west of the Congressionally designated alignment of the Old Spanish National Historic Trail (NHT), which the National Park Service co-administers with the Bureau of Land Management. Because of the distance, no direct impacts on the trail are foreseeable. The Proposed Action consists of constructing and operating a solar generation energy center, consisting of a photovoltaic installation up to 100 megawatts, and a concentrating solar power installation up to 100 MW in size. Transmission lines and associated facilities will also be required. The National Park Service does not believe that a photovoltaic installation would have the potential to impact the setting of the Old Spanish NHT in this location. The National Park Service reviewed the K Road Moapa photovoltaic project earlier this year, located nearby, and did not find any impacts to the Old Spanish NHT or the setting of the Old Spanish National Historic Trail. However, depending on the nature of the concentrating solar power installation, visual impacts could occur on the trail. Specifically, power tower technology, described on the project webpage as one option, could involve the installation of 250-foot tall towers that may be visually intrusive on the trail. The other concentrating solar power technology involves concentrating mirrors that focus sunlight on horizontal pipes. This technology would only be 80 feet tall, much closer to the ground, and would likely pose very little visual impact to the setting of the Old Spanish NHT. The transmission lines and associated facilities will not impact the trail or the setting of the Old Spanish National Historic Trail, based on the experience of the National Park Service with the K Road Moapa photovoltaic project. If you have any questions or need additional information, please contact Amee Howard, Renewable Energy Specialist - NPS Pacific West Region at (702)293-8645 or amee\_howard@nps.gov."

Amee R. Howard

Renewable Energy Specialist

Pacific West Region

Lake Mead National Recreation Area

Office: (702)293-8645

Cell: (702)308-3178

Comment Reference Document 9

Skip Canfield

From: Alex Lanza

Sent: Wednesday, August 29, 2012 2:15 PM

To: Skip Canfield

Subject: RE: Nevada State Clearinghouse Notice E2013-031 - DEIS Moapa Solar Energy Center

Good afternoon Skip;

The Nevada Division of Environmental Protection (NDEP) - Bureau of Water Pollution Control (BWPC) - does not have any comments regarding Notice E2013-031 - DEIS Moapa Solar Energy Center, Nevada. Please note that the entity who manages this Moapa Solar Energy Center project may be subject to BWPC permitting associated with any of the discharges of the entity managing the Moapa Solar Energy Center - including, but not limited to, well development, wastewater, Diminimis, UIC, and domestic sewage discharges. Thank you for the information and the opportunity to comment. If you have any questions, please contact me at (775) 687-9468.

Respectfully,

Alexi Lanza

Alexi Lanza, P.E.Permits Branch - Bureau of Water Pollution Control Nevada Division of Environmental Protection 901 S. Stewart St., Ste 4001 Carson City NV 89701 Phone: 775.687.9468 - Fax: 775.687.4684 www.ndep.nv.gov Please visit BWPC's main website: http://ndep.nv.gov/bwpc/index.htm 1

59 Please join our electronic mailing lists: http://ndep.nv.gov/bwpc/email.htm From: scanfield@lands.nv.gov [mailto:scanfield@lands.nv.gov] Sent: Monday, August 13, 2012 1:40 PM To: Alan Coyner; Alan Jenne; Alisanne Maffei; clytle@lincolnnv.com; Brad Hardenbrook; ddavis@unr.edu; dmouat@dri.edu; Edward Foster; ed.rybold@navy.mil; gderks@dps.state.nv.us; James Morefield; Jason Woodruff; Jennifer Newmark; Jennifer Scanland; munteanj@unr.edu; jprice@unr.edu; kirk.bausman@us.army.mil; cohnl@nv.doe.gov; Lowell Price; Mark Freese; Mark Harris; Mike Dondero; deborah.macneill@nellis.af.mil; escomm2@citlink.net; Octavious.Hill@nellis.af.mil; Pete Anderson; Pete Konesky; Rebecca Palmer; Rich Harvey; Robert K. Martinez; Sandy Quilici; Sherry Rupert; Steven Siegel; tcompton@dot.state.nv.us; Terry Rubald; Richard Ewell; tmueller@dot.state.nv.us; Tod.oppenborn@nellis.af.mil; William.Cadwallader@nellis.af.mil; zip.upham@navy.mil; Joe Strolin; Alex Lanza; Dave Marlow; Michael Visher; Kevin J. Hill; dziegler@lcb.state.nv.us; Richard A. Wiggins; Robert Gregg; Shimi.Mathew@nellis.af.mil; Skip Canfield; whenderson@nvnaco.org; Tim Rubald; djohnston@dps.state.nv.us; John Walker; Karen Beckley; Russ Land; Cliff Lawson; mstewart@lcb.state.nv.us; sscholley@lcb.state.nv.us; Jennifer Crandell; Madams@ag.nv.gov; McClain Peterson; WHowle@ag.nv.gov Subject: Nevada State Clearinghouse Notice E2013-031 NEVADA STATE CLEARINGHOUSE Department of Conservation and Natural Resources, Division of State Lands 901 S. Stewart St., Ste. 5003, Carson City, Nevada 89701-5246 (775) 684-2723 Fax (775) 684-2721 TRANSMISSION DATE: 08/13/2012 U.S. Bureau of Indian Affairs Nevada State Clearinghouse Notice E2013-031 Project: DEIS Moapa Solar Energy Center Follow the link below to find information concerning the above-mentioned project for your review and comment. E2013-031 - http://clearinghouse.nv.gov/public/Notice/2013/E2013-031.pdf cent Please evaluate this project's effects on your agency's plans and programs and any other issues that you are aware of that might be pertinent to applicable laws and regulations. cent Please reply directly from this e-mail and attach your comments. cent Please submit your comments no later than Tuesday September 4th, 2012. 2

60 Comment Reference Document 10

62 10-ALT 1

64 10-BIO 1 10-WAT 1 10-WAT 2 10-ALT 2

65 10-WAT 3 10-AQ 1 10-AQ 2

67 10-BIO 2 10-BIO 3 10-BIO 4 10-BIO 5 10-CUM 1

68 10-CLI 1 10-CLI 2 10-HAZ 1 10-OTH 1

69 "Comment Reference Document 11 ..6 PTIBLIC COMMNNT TORM Bureau of Indian Affairs MOAPA SOLAR ENERGY CENTER PROJtrCT www.MoapaSolarEnerryCenterEIS.com Scoping Comments NAME: t7\*na ADDRESS N\*,,, n,Yt j rr',,,,,i. o S ns rrtr,s < r,,.r Cd ?o 6ox Z' "" 7/'0+oo () I have no comments, please keep me informed. () Please remove me from your mailing list for this Project.

In the revised text, the references are maintained as they are mainly in the context of contact and document details, and thus show their association clearly with no additional named entities requiring resolution.I have the foliowing comments about the Moapa Solar Energy Center Project: "Return to: Ms. Amy Heuslein, Regional Environmental Protection Officer, BIA Western Regional Office, 2600 North Central Avenue, 4th Floor Mailroom, Phoenix, AZ 85004 Email: amy.heuslein@bia.gov (Or fold, seal, and add a stamp to the back of the sheet)"

A MIDAMERICAN ENERGY HOLDINGS COMPANY

August 20, 2012

Francis (Fran) Cherry

Senior Environmental Specialist

P.O. Box 71400

Salt Lake City, UT 84171-0400

Phone 801-937-6133

fran.cherry@kernrivergas.com

Ms. Kellie Y. Youngbear

Superintendent, Southern Paiute Agency

Bureau of Indian Affairs

P.O. Box 720

St. George, UT 84771

Mr. Paul Schlafly

Dear Ms. Youngbear:

Kern River Gas Transmission Company ("Kern River"), a subsidiary of MidAmerican Energy Holdings Company, appreciates the opportunity to submit comments concerning the Proposed Moapa Solar Energy Center, Clark County NV, public scoping, in preparation of an Environmental Impact Statement. Kern River respectfully submits these comments on issues that should be considered in the preparation of the draft Environmental Impact Statement (EIS) for the Proposed Moapa Solar Energy Center, Clark County NV project. Kern River owns and operates 1,680 miles of interstate natural gas pipeline through the states of Wyoming, Utah, Nevada and California. By state, 154 miles are located in Wyoming, 712 miles in Utah, 276 miles in Nevada and 538 miles in California. Approximately 850 miles are located on federally managed lands. The Kern River pipeline system consists of 1,310 miles of 36-inch diameter steel pipe and 219 miles of 42-inch diameter pipe. The remaining portions of the Kern River pipeline system are 30-inch diameter or less. The Kern River pipeline system currently has a design capacity of more than 2.14 billion cubic feet per day and is considered critical energy infrastructure for the western United States. For example, the Kern River pipeline system delivers approximately 25% of the average daily demand of natural gas into California and 54% of the average daily demand of natural gas into Southern Nevada. Because Kern River transports natural gas in interstate commerce, Kern River is regulated by the Federal Energy Regulatory Commission ("FERC") under the Natural Gas Act. As can be ascertained from the project description accompanying the scoping meeting invitation, the detailed maps of the proposal, and in looking at energy expansion needs, additional, especially green sources of energy, are needed to keep abreast with the rapid population expansion of the southwest. Natural gas demand is undergoing a similar growth requirement, not only in the southwest, but across the nation. Business and industry as well as the general public are looking for additional sources of energy that are cost efficient and that exhibit low pollution impacts. Kern River notes in the scoping description, the proposed location of the project site on the Moapa Indian Reservation would be in the vicinity of the Kern River gas transmission pipelines and several other utility corridors in the area. Just as the Moapa Solar Energy Center is trying to meet the ever increasing demand for additional power, so too is Kern River as well as many other companies that are attempting to meet the demands for energy expansion. Power companies, gas transmission companies, and other linear based utilities need corridors and routes to safely and efficiently traverse the western United States, especially in the Las Vegas area. As this EIS and site plan are developed, special care should be taken to protect other users of 11-SOC common corridors, allowing all the ability to continue to operate and maintain their respective operations, complementing everyone's needs. This protection is necessary so as to not negatively affect other transmission needs that would environmentally or economically put any user at a disadvantage relative to each other. Kern River is also concerned that as corridor crossings are determined as a part of this process, enough space should be identified to allow crossings to be as near to right angles as possible to separate transmission lines so interference is minimized and the possibility of construction damage is minimized. There is also concern over the mitigation of potential electrical current negatively affecting pipelines causing corrosion issues.

Summary

Many areas of the West are experiencing unprecedented growth with ever-increasing energy demands and an overtaxed energy delivery system. Energy supply demands, existing capacity constraints and utility service reliability obligations make it imperative that as new major systems are added, despite the difficult environmental and permitting challenges facing western infrastructure developers, care be taken not to harm existing energy providers' systems. A well-considered EIS and cooperation between the permitting agencies, proponent and other users, holds great promise as a solution to the infrastructure needs of the developing southwest described in the scoping process.Toward that end, Kern River is hopeful the recommendations provided above will help assure that the Moapa Solar Energy Center facility is processed in a timely manner and constructed in an environmentally responsible manner. Kern River appreciates the opportunity to comment on this scoping process and looks forward to cooperating in the EIS process. If any reader has any questions on these comments or would like more information, the reader is encouraged to feel free to contact Fran Cherry, Senior Environmental Specialist at Kern River Gas Transmission Company, at 801-937-6133 or via email at fran.cherry@kernrivergas.com.

James Flier submitted a comment provided via the project website, stating "full speed ahead." James Flier's address is 744 E Milano Drive, and James Flier would like to be included on the mailing list. James Flier's city is Las Vegas, and James Flier's zip code is 89081, located in Nevada.

The transcript of proceedings of the Moapa Public Meeting involving the U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians was taken on Tuesday, August 21, 2012, at 5:29 P.M. at One Lincoln Street, Moapa, Nevada. The proceedings were reported by Donna J. Abrahamsen, RPR, a Certified Court Reporter in and for the State of Nevada. Present at the meeting were several individuals, including William Anderson, Tribal Chairman of the Moapa Band of Paiutes; Paul Szewczykowski, from Logan Simpson Design Inc.; Kellie Youngbear, from the Bureau of Indian Affairs; Amy Hueslein, from the Bureau of Indian Affairs; Paul Schlafly; Kathleen Sprowl, from the Bureau of Land Management; Brenda Wilhight, Vanessa Hice, and John Evans, all from the Bureau of Land Management; and Daniel Menahem and Gary Cantley, from resAMERICAS.

CHAIRMAN WILLIAM ANDERSON: Good afternoon, everybody. Chairman William Anderson welcomed everybody present to the night’s scoping meeting. Chairman William Anderson wished to bring their council member, Richard Fisher, forward to give a blessing for the day.

MR. RICHARD FISHER: Good evening. Father, Lord in Heaven, Richard Fisher thanked the Father for the time being present and for the opportunity to come together. Richard Fisher asked for a special blessing upon the food that was partaken, asking for it to nourish the body and give strength. Richard Fisher expressed gratitude for the evening and asked for the Father’s hands to be laid upon the place for safety and welcomed the Father’s presence. Richard Fisher concluded by giving honor and praise and asking for safety for everyone on their way.We thank you for that and 20 carefully give you the honor and presence. In Jesus' name. 21 Thank you. 22 CHAIRMAN WILLIAM ANDERSON: All right. Thank you 23 for that, Richard. Well, first of all, I want to introduce 24 myself. My name's William Anderson, Chairman for the Moapa 25 Band of Piutes. This is the second scoping meeting that I am 77 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 very pleased to go ahead and be a part of. The first one 2 that we threw was K Road, the first meeting was -- the first meeting went very well. I am pleased how things worked out. And the way things are 4 working out right now with resAMERICAS on resAMERICAS's second site, 5 the same thing is going to happen again. And 6 we are going to go ahead and continue on and start 7 development for the second site. 8 And what happened was is that the main thing that 9 we were trying to focus on was just a lot of issues that 10 were being -- work done during the time -- most of the time we go 11 ahead and make sure we get the right type of project that's 12 been brought out here. With resAMERICAS, what resAMERICAS is going 13 to do is resAMERICAS is going to offer not only just the PV panels 14 that you see displayed here around the building here, but 15 also we are going to go with a concentrated solar which 16 resAMERICAS is going to go ahead and talk to you more all, but 17 resAMERICAS is going to explain a lot more to it. 18 The -- the main reason that we -- that I wanted to 19 be a part of this project is to make sure that we go ahead 20 and bring this development towards the reservation. And 21 where in the, you know, I don't want to go ahead and turn to 22 another subject, but it's basically what we are trying to do, 23 is we are trying to go ahead and provide clean energy. 24 Clean energy is something that we want to go ahead 25 and have, something that would not affect our people. 78 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 Something that would not affect our land, animals, plants, 2 and the earth -- and Mother Earth itself. We want to go 3 ahead and ensure that we protect Mother Earth and do everything we can 4 to go ahead and make sure that everything goes through as 5 smoothly as the way everything should be. 6 The process has been going on for a while 7 that this process has been handling here. And during this 8 time, we also face another fact that was coming into play 9 which was with environmental issues dealing with coal. And 10 to see so many people pass away as well as I want to give my 11 respects out to Calvin who's still there now. Calvin is still 12 hanging in there. And Calvin is one of the people that's 13 closest to the plant. 14 And to ensure that we don't have the type of 15 problem again, I want to make sure that we do something 16 that is right for the environment, right for Mother Earth, 17 right for, you know, everything that we have been trying to 18 work towards. And basically, that's what we are a part of. 19 Our people are -- we are connected to this earth. 20 We are connected to this land. And through this connection, 21 this is how we want to go ahead and show this connection. We want to go 22 ahead and bring together, not only a new technology, but a 23 new technology that will work with our people as well. And 24 with everything that we have here and everything we have is 25 from the sun, we have plenty of sun. We have plenty of 79 "Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 land, and. We also got a power corridor going through our 2 land and issues that we are facing right now, this is how 3 things seem to work for us. 4 And, you know, just how things happen is the way 5 things happen. And that's the way 6 things are tended to be. And that's what we are trying to 7 work towards.Again, we're trying to go ahead and be responsible. We're trying to show that we're not just going to go ahead and just sit here and just take this type of pollution. We're also going to go ahead and doing something towards pollution and go ahead help towards pollution, ultimately finding ways to find new energy. Many, many ways that we can go ahead and do this. The best way right now is working with solar energy. And when I first met Daniel, it was we wanted to go ahead and make sure Daniel and I did everything that was right. I'm glad through a lot of hard work and a lot of talking and a lot of phone tag and everything we have been doing all this time, the situation is now where we are today. It just seems again how things work with everything we have been going and doing right now. The event was during the energy summit where we were at getting a lot of publicity. And it just so happened to be that very same day that when -- when we were approved for our fast track. And I didn't know, you know, at the time that Daniel called me and, ""Oh, did you get the message? Did you get the e-mail?"It's like I'm on my way there."" Daniel goes, ""Yeah, we got approved for approval."" I said, like, ""Really?""

I just couldn't -- the news just blew me away how things just kind of just worked, how everything happened all together. It was just good news on top of good news on top of good news we received all day from both developments. Actually, the news was three; the news was two for solar energy and one for Harry Reid to go ahead and give us the support we were looking for. And, again, it's been through a lot of hard work to go ahead and work with all these agencies to go ahead and work with the BLM, work with the BIA, Fish & Wildlife, and everybody that we have been involved with during this time. And we want to make sure that we do the right thing again. We want to make sure -- we also take care of our land, and we want to make sure we take care of our animals. Most of all, ensure that we have -- we are healthy enough to go ahead and see this project through.

And so that's why when -- when these things just happened, events were just, like I said, one after another. And the last part was when Ken Salazar himself wanted to ensure that we got this project to go through and, you know, it was just a lot of hard work to go ahead and just give Ken Salazar notice to us, and to see if Ken Salazar could get that recommendation that we were looking for. So again, I'm glad -- again, it was like only, what, seven renewable projects across the country that were set for fast track. Two were here in the State of Nevada, and out of all the solar projects that were -- the project that was waiting for this approval, resAMERICAS was the other one. And, again, it was something that the -- I was glad to see the project happen. So the success was one thing after another, and here we are today. And like I said, I'm glad to be here for the second one to be a part of this, and I want to go ahead and to also let you know that the BIA worked so hard with us, too, to make sure that we got this project to work where we are today.

Without the BIA's help, without everything that the BIA has done, we probably still will be another year behind. But the BIA was working very, very well with all the groups. Amy Heuslein, she'll be coming up here in a bit. Amy Heuslein's the one that's been coordinating that we have been trying to go ahead and focus on and making sure that we do what we have to do to get the EIS through.21 So everything that we have here, from everything that is displayed here, everything we have around here, we have -- Daniel, you don't mind raising your happened over there (indicating). Go ahead and have questions with Daniel. If you want to ask any questions dealing with K Road, they're right in the back over there, too. That's Lori and Alice so Lori and Alice can go ahead and answer any questions, too. But, again, this resAMERICAS might just be what the project is, and I am very glad, very glad to go ahead and get to see where the resAMERICAS project is at right now. So what I want to do now is I want to go ahead and bring the next presentation here that is going to be done by Kellie, Kellie Youngbear, from the BIA. Thanks.

MS. KELLIE YOUNGBEAR: Thank you. My name is Kellie Youngbear. I am a superintendent for Southern Paiute agencies Bureau of Indian Affairs. And our office is located in St. George, Utah. I would like to introduce the agency staff so that you know who the people from the Bureau of Indian Affairs are when the people from the Bureau of Indian Affairs are out here. Christina Varrella, she is our realty assistant. Paul Schlafly, he is our natural resource specialist. And, also, Tamara Dawes which is the western regional realty specialist who is helping us with all of the lease and any documents that pertain to realty. I would also like to thank the Chairman for inviting us, and the process is an exciting process. It's good to see and I am excited to be involved with the process. And if you have any questions, please give us a call, but we are involved because we have trust responsibility over the trust lands in Moapa. So thank you.

MS. AMY HEUSLEIN: Good evening and welcome to the first public scoping meeting for the resAMERICAS Moapa solar project here on the Moapa Band of Paiutes reservation. My name is Amy Heuslein. I am with the Bureau of Indian Affairs, western regional office out of Phoenix, Arizona. I am also the regional Environmental Protection officer. I have been with the Bureau of Indian Affairs over 26 years. I have seen a lot of projects go on Indian lands, some that have gone to construction, and some that haven't. We have gone through a lot of environmental processes, but I am glad to be here to help go through some of what we have to go through to get a project on the ground. Some of the environmental compliance requirements, and I am going to be explaining those here in a moment for you.

In the meantime, I would like to go ahead and do some introductions, also. I have got some staff here from the BI Western Regional office. We've got the regional archeologist with us this evening, Gary Cantley. Gary, can you stand please (indicating). Thank you. We also have representation from the Bureau of Land Management. The Bureau of Land Management is going to be a cooperating agency with us on the Environmental Impact Statement or what we refer to as an EIS, and I am going to have the Bureau of Land Management representatives introduce themselves, if you wouldn't mind. We can start with Brenda, please.

MS. BRENDA WILHIGHT: Hi. I'm Brenda Wilhight, a realty specialist, and I will be the project lead on this particular project in Las Vegas.

MS. KATHLEEN SPROWL: I'm Kathleen Sprowl, and I handle the cultural resources and paleontology for projects, and I work with Brenda.

MS. VANESSA HICE: Vanessa Hice. I'm from the Las Vegas field office. I'm the assistant manager for the lands division.11 MR. JOHN EVANS: I'm John Evans, planning and

12 environmental coordinator for the Las Vegas field office.

13 MS. AMY HEUSLEIN: Thank you.

14 We also have several other agencies, federal

15 agencies, who are cooperating agencies. Unfortunately, these agencies

16 couldn't make it -- be with us tonight. But these agencies include

17 here the list that's on -- on the overhead here, the

18 PowerPoint. And that's the U.S. Fish & Wildlife Service,

19 the National Park Service, the Environmental Protection

20 Agency out of San Francisco, and also, Nellis Air Force

21 Base. These entities all have an interest in this project. These agencies may

22 have should subsequent approval actions that these agencies may adopt

23 this Environmental Impact Statement, EIS, for their federal

24 action these agencies may have. Or these agencies need information from these

25 documents for their own -- for their own compliance purposes Page 11 Sousa Court Reporters 702-765-7100

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1 with us.

2 Before I go into actually the details of the

3 project -- and this is something that I want to make sure

4 that folks also know -- that we do have a consultant working

5 with us, and the consultant is In-Value. In-Value is out of

6 Denver, Colorado, and In-Value is helping to prepare the EIS.

7 And I'd like to introduce Randy Schroeder. Randy Schroeder's going to

8 be talking with us soon. And Jeannette Losstracco, if I

9 pronounce that Jeannette. Jeannette Losstracco's back at the sign-in sheet

10 table.

11 And also to help Jeannette Losstracco, if you guys have not

12 signed in yet, please do. We're trying to keep a record of

13 who's here tonight. We also have some comment cards in the

14 back. So if you're interested in providing any comments to

15 us on this process, that would be good. If you don't want

16 to submit one of the comment cards to us, then you can

17 always e-mail myself or Paul Schlafly. Where is Paul Schlafly again? Paul

18 Schlafly with the BIA.

19 And we also have a website that is available, and

20 then, of course, there's always hard mail if you want to

21 write us a letter. You know, so there are various means for

22 us to hear communications from you-all on this. And then,

23 also, we are -- where is Paul Schlafly?

24 Paul Schlafly, you want to introduce -- Paul Schlafly is our

25 third-party reviewing consultant. You want to introduce Page 12 Sousa Court Reporters 702-765-7100

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1 yourself, Paul Schlafly?

2 MR. PAUL SCHLAFLY: My name's Paul Schlafly, I'll

3 be working with everyone.

4 MS. AMY HEUSLEIN: So you can see we have got

5 quite a full team of folks who are working on this project.

6 Last but not least is with the resAMERICAS, and Daniel Menahem and Ryan

7 Henning were introduced a little earlier, but Daniel Menahem and Ryan

8 Henning. Thank you, guys.

9 And then of course, not -- as I said, if it wasn't

10 for the tribe, Moapa Band of Paiute Indians, we wouldn't be

11 here tonight working -- trying to work toward this project

12 for something for the Moapa Band of Paiute Indians itself. So I'm glad that we're

13 here and I appreciate Chairman Anderson having us --

14 allowing us to have the meeting here and bringing the

15 information to you-all.

16 So let's talk a little bit about where we're at

17 and what the proposed action is for this project. This is

18 going to be a proposal by the Moapa Solar, LLC, group which

19 is basically resAMERICAS. And the Moapa Band of Paiutes.

20 The proposal is for an up to 30-year land lease on

21 reservation for the operation of up to a 200-megawatts solar

22 generation facility, and that includes rights of ways on BLM

23 lands for the transmission line, which could be several

24 transmission lines we're looking at, one of 500 kV line and

25 also a 230 kV line.Both to either -- one to go to Harry Page 13 Sousa Court Reporters 702-765-7100 87 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 Allen substation, potentially one to go to the Crystal 2 Substation. And hopefully, most of you folks know where 3 the Crystal Substation is located at. And then, of course, access to the 4 site, an access road. 5 The access road is going to be here in Clark County on the 6 reservation and also nearby BLM-administered lands. The 7 actual location of the Crystal Substation is in the southwest corner of the 8 reservation, the very southwest corner of the reservation. 9 I think we have a poster in the back that has a map of the 10 reservation where the Crystal Substation is located here on my right or your left 11 and then also another poster that's more site specific in 12 the back for the project. 13 Why are we doing this? Well the tribe says the tribe 14 would like to provide some economic development for the 15 reservation and other benefits such as jobs and a revenue 16 source for the Moapa Band itself. So -- and also trying to 17 meet some renewable energy goals that have been set out for 18 the company itself and for the region itself. Okay. 19 I'm going to go into why we're doing this process 20 the NEPA process, but I have some background here. This is 21 just my information and where my office is located at. And, Randy, I 22 think Randy has to put up that other presentation, if Randy 23 could, so just for a moment. While Randy is doing that, the 24 Bureau of Indian Affairs is responsible and has jurisdiction 25 for Indian lands. So what we're looking at here is to Page 14 Sousa Court Reporters 702-765-7100 88 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 ensure that the environmental compliance is done correctly, 2 and we have to go through this Environmental Impact 3 Statement process. 4 But I wanted to share with you -- Gary, I need 5 some lights so -- because the presentation is a little darker so people 6 can see the presentation. The Bureau of Indian Affairs is in the Department of Interior, and I 7 wanted to show you kind of where the Bureau of Indian Affairs sits in the process of, 8 you know, where the Bureau of Indian Affairs is located, my office is. 9 We have got our central office which is our 10 Washington, D.C., office. And the central office is located in Washington, 11 D.C. And then we have the Assistant Secretary for Indian 12 Affairs and the Bureau of Indian Affairs director. We have an office of trust 13 services that handles a lot of the trust activities like our 14 realty activities our natural resources, forestry for tribal 15 lands. 16 And then there's an office of management support 17 services, and underneath the office of management support services is the division of 18 environmental and cultural resources management. Again, 19 these are offices back in Washington, D.C. We report to all of those 20 folks one way or another. In our western regional office in 21 Phoenix, we have a regional director, and under the regional 22 director is a deputy director of trust services. 23 Underneath the deputy director of trust services is where my office falls within 24 the division of environmental, cultural, and safety 25 management. So my office is called Environmental Quality Page 15 Sousa Court Reporters 702-765-7100 89 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 Services that's listed in red up here. And then we work 2 with the field agencies and the tribes, get down on the 3 ground and work with the field agencies and the tribes. Also provide technical 4 assistance and try to involve these efforts that we're 5 working on the ground right now with this Environmental Impact Statement process. 6 So that's how we're working with Kellie and Paul 7 and Christine in camera to make sure we're coordinating 8 correctly for you guys out here. The Bureau of Indian Affairs western region, I 9 just wanted to give you a little background. The Bureau of Indian Affairs western region covers 42 10 tribes and actually a six-state region. The majority of the 11 tribes are in Utah, Arizona, and Nevada. 12 Then there's some overlap along the Colorado River 13 down in Arizona into California and then here in Nevada up 14 in Idaho and Oregon, we have a couple tribes that go into 15 those states, too. So we've got 12 million acres of not 16 only tribal lands but also Indian allotments that we deal 17 with and that we have responsibilities for.To give an idea, we have got a pretty big area to cover. A lot -- a lot of issues are out there. Oh, I know this explanation gets a little busy, and I don't want to give too much detail with this presentation, but I wanted to explain a little bit what the Environmental Policy Act is. We call the Environmental Policy Act NEPA. We like to use acronyms. So NEPA is the term tonight. NEPA was a public law that originally came into play back in 1969 and was approved by President Nixon in 1970. So NEPA has been on the books for well over 40 years.

We have some regulations that we call the Council Environment Quality Regulations, and those regulations were issued back in the 1978 time frame. And then the department came up with some implementing procedures in the early 1980 time. Then we also had a final rule on the implementation of the Environmental Policy Act itself, which turned those particular implementing procedures into regulations for the department in 2008.

So you can see the kind of transition that is taking place. As far as the Bureau of Indian Affairs (BIA) is concerned, BIA had the original handbook that actually came out in 1983. The BIA updated the handbook in 1993 or revised it. And then the handbook was revised again in 2005. The handbook was released here within about a week ago for another update and revision. And now we are calling the updated document the NEPA Guide Book. The previous version used to be called the NEPA handbook. So the NEPA Guide Book is out on the street right now.

The NEPA Guide Book is publicly available on the BIA website, also. We also had categorical exclusions, which is another form of NEPA work. And we have had categorical exclusions on the books since 1996. We had a new categorical exclusion issued here recently just within the last month here for home site leases. So having categorical exclusions is a good plus for us in Indian country. And then, of course, BIA has their tribal government to government consultation policy, which was done in December of 2000. But also, the BIA has a policy that was issued about a year ago in 2011. So -- so we have got some guidance for how we deal with tribes on a government to government basis, also.

This handbook, as I said, the last handbook we did was in 1993, and then we did 2005, and now we have the newest handbook here in 2012. All right. There are some key other environmental laws that we have to deal with when we go down the road with developing this EIS document. And as you can see up here, these key environmental laws include the Endangered Species Act, and that's where we are working with the U.S. Fish & Wildlife Service.

And with this particular project, we will have an endangered species we are dealing with on Moapa. We have the Desert Tortoise, the Mojave Desert Tortoise. Of the tortoise on the last project, the K Road Project, we had quite a few tortoises on that particular site because the site was a good habitat site for the tortoises and we found a lot. On the site for the resAMERICAS site, we are not finding as many tortoises because I think the habitat is not as great as the other site was.

But we still have to work with the U.S. Fish & Wildlife Service through what we call "formal consultation," and there's a process we must go through for that. So that’s one of the laws we are responsible for and how we’re going to accomplish that process and working with, you know, the requirements that we must get through.

The Clean Water Act is another law. Also, the National Preservation Act.That deals with cultural resources, archeological resources, and the Bureau of Indian Affairs would be doing surveys here in the near future for those resources. And hopefully also have some tribal monitoring going on associated with those surveys.

The Clean Air Act, and then there are numerous executive orders that have been issued by the President or secretarial orders issued by the Secretary of the Interior the Bureau of Indian Affairs must follow, too. So there are quite a few things that come together in this one document that the Bureau of Indian Affairs is working on. There are some other federal Indian policies out there just to be aware of that have been issued through, you know, the last, oh, I'd say last several 20 years or so. Those policies include consultation and coordination with Indian tribal governments. Also, memorandums that have been issued to the heads of executive offices on how to deal with tribes.

The Bureau of Indian Affairs has some secretarial orders and then also other executive orders such as the executive order on environmental justice. So, again, these executive orders need to be taken a look at within the NEPA document, the Environmental Impact Statement (EIS) document that the Bureau of Indian Affairs is working on. There are different types of federal activities and actions that are subject to NEPA, also. And the Bureau is responsible. Anytime the Bureau of Indian Affairs deals with some of these activities up here, such activities will trigger the Bureau's requirement for compliance with NEPA. The activity could be a policy. It could be a plan. It could be a program or a project.

If the Bureau of Indian Affairs is looking at approvals that the Bureau of Indian Affairs has to approve on, normally these approvals will fall under realty-type actions such as leases, rights-of-ways, permits, what is called fee and trust acquisitions. That means maybe the tribe has some land that the tribe brought privately and the tribe wanted to bring it into trust status, meaning part of the reservation. Some forest activities to housing, roads, irrigation, agricultural projects, so there are a number of different areas the Bureau of Indian Affairs might need to approve something.

As far as funding actions, if the Bureau of Indian Affairs gets funding down through the Bureau of Indian Affairs' annual budgets for the Bureau of Indian Affairs' project on tribal lands, that may trigger NEPA compliance, and the Bureau of Indian Affairs has to do some kind of documentation, clearances, surveys, et cetera, to comply with these Acts -- or these federal laws and Acts that were shown earlier. And then there could be legislative proposals that come down from Congress that require the Bureau of Indian Affairs' compliance with NEPA. Sometimes these proposals exempt NEPA, but sometimes they don't so the Bureau of Indian Affairs has to make sure the Bureau of Indian Affairs is following suit with those proposals.

Why are NEPA documents required? Well, NEPA documents are required because there's a federal nexus that the Bureau of Indian Affairs has to comply with such as funding or approvals. So if the Bureau of Indian Affairs is funding a project as an example or the Bureau of Indian Affairs is approving a lease of land like in this case for this project, with resAMERICAS, the Bureau of Indian Affairs is going to approve in coordination with the tribe that's negotiated a lease for the lease of that particular land for that project. Because of that, the Bureau of Indian Affairs has to approve that. That triggers the Bureau of Indian Affairs' requirement to do this NEPA document, this Environmental Impact Statement (EIS). Why is it important? Well, NEPA documents are really important to make better decisions and to identify any concerns or issues that might come up from that project, and if necessary, any mitigating those impacts.

So, for example, there is the Desert Tortoise, and the Bureau of Indian Affairs has to make sure that the Bureau of Indian Affairs is not harming the Desert Tortoise, that the Bureau of Indian Affairs makes sure that the Bureau of Indian Affairs deals with that issue. The Bureau of Indian Affairs is not going to get involved with having a problem with an archeological site, as an example. The Bureau of Indian Affairs mitigates that issue with that particular resource.

What are some of the environmental issues that may be out there that the Bureau of Indian Affairs is dealing with as far as a project? Well, as was said, biological resources, cultural resources, water resources, surface and groundwater.This project will be explained in a little, but this project may have some water usage on this project. And so the Moapa Public Meeting attendees think the project's going to include a pipeline for some water because the solar concentrated part of the project uses water and has some towers associated with the solar concentrated part of the project. Moapa Public Meeting attendees are not going to go into the details on that. Randy is to explain what the details are about. Air resources, climate change, environmental justice, Indian trust assets, social economic conditions, Moapa Public Meeting attendees have to document in detail those things, and then human health and public safety.

Those are all things that Moapa Public Meeting attendees are going to write about and talk about in the environmental document. Potential or possible mitigation measures -- and Moapa Public Meeting attendees kind of go through this process that analyzes the impacts in the environmental document -- could include, for example, the biological resources, installing fencing around the project area, putting in buffer zones, relocation of species, monitoring of the construction activities, establishment of tribal escrow accounts which is a mitigation fee, and that might occur for the Desert Tortoise here because the Desert Tortoise has been had to be done for the prior project, the K Road Project. Cultural resources, again, monitoring of construction activities, data recovery, including potential for testing and excavation. Moapa Public Meeting attendees don't think Moapa Public Meeting attendees are going to have to go that far with this particular project because Moapa Public Meeting attendees don't have any large sites Moapa Public Meeting attendees are dealing with. The one area that Moapa Public Meeting attendees have to deal with is the Old Spanish Trail in that area, and that will be from a visual perspective, visual impacts that Moapa Public Meeting attendees have to look at. And, for example, for water resources, monitoring could be putting in monitoring wells for water quantity or quality, if monitoring is a requirement and monitoring would be necessary. Moapa Public Meeting attendees just want to give Randy some examples of potential mitigation measures. Okay.

Who's involved with this process? Well, there's a lot of people involved in this process. Moapa Public Meeting attendees have the lead agency which in this case is the BIA, Bureau of Indian Affairs. Moapa Public Meeting attendees have the cooperating agencies which Moapa Public Meeting attendees mentioned before. Again, Moapa Public Meeting attendees will repeat that, BLM, the National Park Service, U.S. Fish & Wildlife Service, Nellis Air Force Base, and the Environmental Protection Agency.

Moapa Public Meeting attendees have five federal agencies that are involved as cooperating agencies and one more, the Moapa Band itself, the Moapa Band of Paiutes. Moapa Public Meeting attendees could have allottees, if Moapa Public Meeting attendees have allottees, allottees might be involved. Third-party consultants, like Randy is here as a third-party consultant or Paul who's helping Moapa Public Meeting attendees here. The project of the private project applicants. Well, private project applicants would be resAMERICA. There may be other federal agencies that aren't cooperating agencies might have an interest. State and local agencies, the general public, and Moapa Public Meeting attendees also could have environmental groups that may have an interest in this project. So the project includes the gamut of different entities that are involved.

There are three types of environmental documents, and the environmental document Moapa Public Meeting attendees are concentrating on tonight is the Environmental Impact Statement, the third one up there. The other two are others that Moapa Public Meeting attendees have to deal with. If the other two aren't as large a project or have consequences or are called significant impacts, but for tonight's purposes, Moapa Public Meeting attendees are dealing with the third type: environmental impact statements. Okay. That was quick. At least in Moapa Public Meeting attendees' eyes it was quick. So -- all right. Moapa Public Meeting attendees think Moapa Public Meeting attendees will go on now here is Moapa Public Meeting attendees are going to have Randy go ahead and come up and get a little more detail about the project itself so attendees can have an idea of what's going to be on the ground.I just wanted to at least share 18 with you kind of why we are doing this process and what this process is about, and then that way, you guys can have a feel for, you know, why we are going down this path we are going. So with that in mind, I will go ahead and let you start -- well, actually, yeah. Let me finish one more slide here, I think that we have up here. And this is the EIS process and the schedule. And if we are lucky, we will get through the EIS process. The Department of Interior, by the way, has put the EIS process as a priority project for us for this next year. So basically, we are in the public scoping process right now here in August of 2012. We hope by next spring, by April time frame is what we are looking for, is to have a draft EIS available. And then that draft EIS will go out for a 45-day public review. We will be back here again having another meeting just like this. But we will have the draft EIS -- instead of calling the meeting a "scoping meeting," the meeting will just be a public meeting where you guys will have the opportunity to have the draft EIS in hand for a few weeks. Take a look at the draft EIS and then if you see any issues or you want to submit comments on the draft EIS at that time, you can, or maybe after, towards the end of the comment period time. And then we are going to have the -- hope to have a final EIS done probably in the fall of 2013. October time frame. We normally take the final EIS out for a 30-day review. We will not have another meeting at that time. We are not really required to under the regulations. But then by December, we hope to have a record of decision done. And that is the process we go through is to develop the draft EIS, get to a final document, and then issue a record of decision. That Record of Decision is either given to our regional director in Phoenix of BIA to make the decision, or they can move the Record of Decision up the ladder to our Washington office, our Bureau director, or the assistant secretary of Indian Affairs or like the last one for K Road Project, the Record of Decision went to the Secretary of the Interior group, and this might go up to that level. We will just have to see how-- what they want to do at that time frame. But we had the Secretary actually approved that document. Other than I told you how could you submit comments, if you would like to, verbally at this meeting here after we are done with the presentation, the comment form, or comment card in the back and leave the comment card behind for us or mail the comment card in. Directly, if you want to, if you do not want to speak to us formally here, you can go sit with the young lady over here, our court reporter. If you want to talk to our court reporter and just say, "I have got a come of comments I would like to give for the record put down." Or you can send the comments to either Paul or me via e-mail address and also via the website. We have a website that is up and running now, if you would like to do that, we can do that, too. And that information when this slide goes off, this information is over here on one of those back posters, also. Okay. Randy, well, I will let you take over. So let me introduce Randy Schroeder, please. MR. KENTON LEE: Who are you? MS. AMY HEUSLEIN: I am Amy Heuslein. I am with the Bureau of Indian Affairs in Phoenix, western regional office. RANDY SCHROEDER: Okay.I'm just going to give a quick summary of the document to provide an idea of what is being proposed here. And, again, Amy touched on the project already. The purpose of the project is to provide a diverse and long-term economically viable revenue stream for the tribe, as well as providing jobs and assisting in the goal of developing more renewable energy. All of the states and the federal government also have goals for renewable energy development, and this solar energy project will help meet those goals. Also, the lease and use of this land for solar energy will optimize the tribal lands while providing the economic benefits that were just talked about.

The location was talked about a little bit. We have a map here that will be brought up, and there are other maps as well. What can be seen when the maps are shown is that the solar field itself, the solar site, is located wholly on the reservation in the southwest corner, as Amy mentioned. But off the reservation, there are linear features, two transmission lines, and an access road that would cross BLM lands and require rights-of-way. The two transmission lines: One is roughly six to seven miles long and would go south from the southwest corner of the reservation to the existing Harry Allen Power Plant. There's a substation at the Harry Allen Power Plant that the line would interconnect with. The line would be a 230 kV line, and then another line would go approximately a mile to the east to the Crystal substation, and that would be a 500 kV line. In addition, the access road would be about two-and-a-half miles long. Again, both transmission lines and the access road would be on BLM land, with some of the access road on the reservation before the project exits. So here is a map just showing the general location of the project relative to the reservation. The southwest corner of the reservation can be seen. There's a thousand acres there. That's the proposed project site boundary. It can be seen relative to the City of Las Vegas. Everyone knows where we are because we're here right now. But the site itself is located way down in the southwest corner of the reservation.

This is more of a close-up view, and this close-up view shows all of the associated features as well. Again, the thousand-acre project site is in the southwest corner. One proposed transmission line corridor would go due south from the project site. The yellow land represents all BLM land. The line goes south until it would intercept all of the existing transmission lines that are out there, which would follow down to the Harry Allen site. The substation to which the line would interconnect is on the south side of the plant. So depending upon where the utilities dictate these lines would interconnect, the connection would either come in this way or that way if a connection on the northwest side or the southeast side is required.

Then the second line that was talked about, going over to the Crystal Substation, would follow the reservation boundary, the southbound reservation, to a point due north of the Crystal Substation, and then it would cross BLM land there. The primary access is the frontage road along I-15, and there's an existing road that goes in this direction, follows either one of the transmission rights-of-way or the gas pipeline rights-of-way that are there, and then it would access the site in that manner.

And if the new transmission line is built, then another option for the road would be to follow the new access road for that transmission line to a point where the access road would interconnect with another existing road that is on BLM land. So again, about a thousand acres are there, with two transmission lines, and then access to the project—these are the primary components.24 Just -- again, just verifies what we just went 25 over, but the document also talks about the different technologies Page 29 Sousa Court Reporters 702-765-7100

103 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 that are being considered for the solar project. There are 2 a couple different technologies. One technology is a Photovoltaic 3 technology similar to the K Road Project. But also being 4 considered are two different types of concentrating solar 5 technologies, and the discussion will cover those a little bit more 6 here. 7 One of the CSP technologies, concentrated solar 8 technologies, is the Areva technology, and this slide kind of 9 shows a schematic of the process, and basically there are a 10 number of mirrors that are focused on an elevated tube 11 filled with fluid, water, and then the sun hits those 12 mirrors that are reflected up to that tube, heating the water 13 sufficiently to create steam which turns a steam turbine 14 subsequently creating electricity. 15 And so after the steam turns the turbine, then the steam 16 reverts back to water, and then the water is recycled through the 17 process. And then this next slide actually shows a picture 18 of what the process looks like, and posters show this 19 as well over here. So this is the -- the tube on the top, 20 the tube is roughly 50 feet off the ground or so. 21 And then each of these mirrors is focused -- 22 the mirrors reflect the light on that tube, which heats the elevated tube up and then all of 23 that hot water is collected and then goes back to the plant 24 where the steam is used to create energy. The 25 other technology that's being considered for the CSP Page 30 Sousa Court Reporters 702-765-7100

104 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 component is the eSolar technology, and this is a power 2 tower, which you might have heard it referred to. 3 Where here you have fields of mirrors similar to 4 the ones previously looked at, and they are all focused on a 5 tower. And so all of these mirrors reflect light to 6 this tower where the light also heats water into steam and then 7 goes through the same cycle where the steam goes through the steam 8 turbine, turns the turbine, makes electricity, condenses, 9 and then is reused in the system. 10 And that's what that looks like. Towers are 11 roughly 250 feet tall, and you can see how each one of these 12 individual mirrors are relatively small mirrors. And 13 they're all focused on the tower to generate the heat and 14 create the steam. Then the Photovoltaic plant, what's being 15 proposed here, is a -- a PV system with a single-axis 16 tracking system which means the rows of panels are aligned 17 north to south, and then the panels track the sun during the 18 course of the day starting on the east and then the panels turn to 19 the west tracking the sun as the sun goes. 20 And then in the case of PV which you may know from 21 other projects, the technology converts sunlight directly to energy so 22 there is no steam component or steam cycle, and so the technology 23 converts the sunlight to DC energy. And then the energy is converted to AC 24 current which everyone uses in their homes and then the energy is carried 25 on the transmission lines. Page 31 Sousa Court Reporters 702-765-7100

105 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 And then all of the electricity from those panels 2 are collected. And then the electricity goes to the site substation 3 where the power is delivered via the transmission lines. 4 This is what the PV panels generally look like, and here observers can 5 see the single-axis tracking mounted in a north/south 6 direction. And this is pretty close to midday where the panels are 7 facing straight up, but again, they -- the panels track and follow 8 the sun over the course of the day. 9 Okay. The associated facilities, most of these facilities have been talked about 10 already. The two transmission lines: 11 One transmission line to Harry Allen, one transmission line to Crystal on BLM lands. The access 12 road is also on BLM land from the I15 frontage road to the site 13 following existing roads, upgrading those existing roads, 14 for the most part.Also, the mention of a waterline is because the two Concentrated Solar Power (CSP) technologies require water to convert to steam. Water will be provided from an existing well on the reservation to the project site via a new water pipeline that would be built.

And then on the CSP technologies, there is what's referred to as a power block where the discussion is about the steam turbine. This is where the steam is collected, turns the turbine, is condensed back to water, and then recycled through. So there's a central facility on the site where all of that process occurs to create the steam, to collect the steam, to create the energy from the steam turbine.

And then that water then has evaporation ponds and cooling towers to condense the water back so it can be reused. And then each of the Photovoltaic (PV) and CSP projects would have operation and maintenance buildings, control buildings, for the processes. And as Amy mentioned earlier, the entire site would be fenced as well. So that is another part of the project.

The biological resources, as Amy also went over these, will not be repeated. But all of these issues here on this slide have been identified as things that need to be evaluated in the Environmental Impact Statement (EIS), and if there are others that are identified through scoping like this, then those would be evaluated as well.

But preliminarily, these are the ones that have been identified. Okay? And this is just a different view of the schedule, again, the status being here, with a draft out next spring, and a public meeting shortly thereafter, the final EIS next fall, and then the record of decision at the end of next year. Okay. That's pretty much the end of the presentation.

So now the floor would be opened to anyone who had a comment or a question. Do you want people to come up here and use the microphone, or does it matter?

So if anyone wants to come up here and use the microphone, you can. There is no need to if you can just provide your name, so it is on the record. Like was said, any questions or comments you might have are welcome.

MR. CONNER CASTILLO: I do. Between now and then, between now and December 13th of next year or whatever, are there going to be any jobs available between now and then, or how is that going to work out?

MR. RANDY SCHROEDER: There won't be any construction on the project until after that decision at the end of next year.

MR. CONNER CASTILLO: Okay.

MR. RANDY SCHROEDER: There will be some surveys done in the coming year, and it was discussed in the field today that there would be some monitor positions for those cultural research surveys. But that is all that is currently known.

MR. CONNER CASTILLO: Okay.

AMY HIGHTOWER: Could we get your name, please?

MR. CONNER CASTILLO: Connor Castillo.

MR. RANDY SCHROEDER: Anyone else?

MR. VERNON LEE: Yeah, I'd like this job here. Is the person a Mexican or a white man or what? Is he Indian? I can say whatever I can say. The answer?

MR. RANDY SCHROEDER: I don't know if that is relevant.

MR. VERNON LEE: Thank you.

MR. RANDY SCHROEDER: Yes?

MR. JACK CASWELL: Jack Caswell with Bureau Veritas. I'm kind of jumping forward here because I kind of came in on the tail end.I have talked with your Director William Anderson in the past. I met Director William Anderson at a Native American event in -- I believe that Native American event was either Las Vegas or Scottsdale -- and we're actually a conformance company that does construction, inspection, plan review, environmental monitoring. We currently represent the Bureau of Land Management as well as the California Energy Commission on concentrated solar or, solartron projects. We are active right now in the Mojave Desert doing that work, and I was curious as how those independent contractors are assigned on Native American lands to ensure construction/inspection is done correctly, shop inspections should materials be manufactured outside the state and outside the U.S., which the materials often are, meet the standards as well as enforce the environmental compliance mitigation measures as an independent third party per the EIS documents that are produced. Who's the authority that chooses that contract or to do that work? I guess this question would be to you, Director.

MR. RICHARD FISHER: That would be the developer. The developer would be the ones that would go ahead and contact them.

MR. JACK CASWELL: Is there a name that I can get so I can contact specific to the developer that I can talk to, speak with about that, because this actually protects Indian lands and Indian investments.

MR. DANIEL MENAHEM: I'm Daniel. You go come see me afterwards.

MR. JACK CASWELL: All right. Thank you very much.

MR. AARON DAEODA: I'm Aaron Daeoda. A question on the water use.

THE REPORTER: I'm sorry. Louder, please.

MR. AARON DAEODA: I'm Aaron Daeoda, D-a-e-o-d-a. I just had a question on the water use for PV. Are you looking at 15-acre feet of water, or what kind water you using for PV water?

MR. RANDY SCHROEDER: I don't know. Daniel, you had numbers on the water use for PV versus CSP?

MR. DANIEL MENAHEM: CSP will be up to -- on PV, the numbers will be good enough how many washings a year people do on the site of the project, so up to 50. No more than 50 feet, and that water may be trucked in and used for that. Also, on that question, water. PV available, or what is that?

MS. AMY HEUSLEIN: Can we repeat that? And I need to have you speak louder for the court reporter. So one more time, Aaron. And Dan, you'll have to stand up and speak, also.

MR. DANIEL MENAHEM: On the water, I'm just referring to the piping PCP well or PC1.

MS. AMY HEUSLEIN: Daniel Menahem, your answer to that was?

MR. DANIEL MENAHEM: I believe there was CSP of 250-acre feet for the PV.

MR. AARON DAEODA: May I? Yes. This -- you can hear me very well. Sir, you say there's other people in the ending. There's one well or using just water -- the ending or the well. You know, what that means?

MR. RANDY SCHROEDER: No, I'm not sure I follow you.

MR. AARON DAEODA: The well?

MR. RANDY SCHROEDER: Yeah, there's an existing well over the water.

MR. AARON DAEODA: The water over here, the river that comes out, and they put a pipe to the river. There you go.

MR. RANDY SCHROEDER: No. This water would come from a well, not the river.

MR. AARON DAEODA: Where's that?25 MR. RANDY SCHROEDER: It's an existing well here Page 37 Sousa Court Reporters 702-765-7100

111 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 on the reservation. 2 MR. AARON DAEODA: Is that right? 3 MR. RANDY SCHROEDER: Yes? 4 MR. VERNON LEE: I'm wondering: Is there any 13-OTH 5 additional plans for supplemental power during the night? 1 6 MR. RANDY SCHROEDER: Right now, supplemental power during the night is not part 7 of what this project is proposing to do. So this project 8 would generate power during the day. The PV panels, like Randy Schroeder 9 said, they generate power when hit directly by the sun. 10 MR. VERNON LEE: Okay. 11 MR. RANDY SCHROEDER: And then the CSP can 12 actually produce power a little bit after the sun goes down 13 because the heated fluid stays warm enough for a while, but 14 not very long. Yes? 15 MS. IRIS DAEODA: Iris Daeoda. Iris Daeoda was just 13-SOC 16 wondering about employment. Is the -- is the company aware 3 17 of our Title Employment Rights office which is an arm of 18 EEOC that says that the company has to hire our native people? 19 MR. RANDY SCHROEDER: Yes. Daniel? 20 MR. DANIEL MENAHEM: Yeah. The company is aware that 21 there are requirements, and the company will be hiring tribe workers 22 development in the comment. 23 MR. RANDY SCHROEDER: Yes? 24 MR. PAUL SCHLAFLY: My name's Paul Schlafly. Paul Schlafly 25 doesn't know if Randy Schroeder or Daniel Menachem could tell Paul Schlafly, but there's the Page 38 Sousa Court Reporters 702-765-7100

112 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 80 feet Areva and then the 250 feet of eSolar, but then they 2 both spin the turbine. But at this point, Paul Schlafly guesses that's 3 why Randy Schroeder and Daniel Menachem are studying the turbine, but what is the advantage of one 13-OTH 2 4 versus the other, if Randy Schroeder or Daniel Menachem could say? 5 MR. DANIEL MENAHEM: The advantage of one over 6 another is price and efficiency. And then the other is the 7 preference of the customer. In this case, the Indians 8 totally may be a preference of one over another. That's why 9 there are all three options. 10 MR. PAUL SCHLAFLY: Thanks. 11 MR. RANDY SCHROEDER: Yes? 12 MR. VERNON LEE: Just all here in the people, 13 like, they can say to Randy Schroeder also: Are the people going to get -- the people 14 got to grab the water or is the water not good, the air, that's 15 what Vernon Lee is saying also, there's ones under the ground that 16 they made or they got to grow it and, you know, take the 17 water and sun it up to here and -- where they all at? 18 Where's the water? Right there. One right there. What is 19 that for? Indians don't have enough wind where Randy Schroeder got that 20 wind. Is that the water was no good? 21 MR. RANDY SCHROEDER: Randy Schroeder is not sure Randy Schroeder follows that 22 one. 23 MR. VERNON LEE: Yeah. Vernon Lee knows Randy Schroeder doesn't. 24 MR. RANDY SCHROEDER: No. Anyone else? 25 MR. VERNON LEE: How much water do the people have in Page 39 Sousa Court Reporters 702-765-7100

113 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians 1 orders, if Vernon Lee may? Again, how much poor -- and power? The people 2 don't have no power or the people got to have more just to make the power? 3 MR. RANDY SCHROEDER: Oh, Vernon Lee is talking about 4 whether or not getting the water will take more energy than 5 the power plant produces? 6 MR. VERNON LEE: Well, if getting the water may be. 7 MR. RANDY SCHROEDER: Yeah -- no. Getting the water would take a 8 very nominal amount of power to pump the water from the well 9 where this project would generate up to 200 megawatts.So 10 hundreds and hundreds, thousands of times over the amount of power the solar project would take to get the water on the ground. Yes?

THE SPEAKER: My name's Anna — how much water is this solar thing going to be using to run?

Well, as Daniel just said a short time ago, if the concentrating solar power (CSP) option is developed, the concentrating solar power option which uses more water, would use up to eight hundred acre feet per year of water and if the photovoltaic (PV) option was selected, the photovoltaic option would use about 50-acre feet per year.

MS. AMY HEUSLEIN: Randy, do you have a comparison of what eight hundred acre feet would look like versus 50 acre feet? How many swimming pools as an example or —

AMY HEUSLEIN: — football field, something like that that you can throw out there off the top of your head so people understand how much water that is?

MR. RANDY SCHROEDER: Yeah, I mean, the easiest reference is in acre feet. Eight hundred acre feet would be enough water to cover an acre eight hundred feet high. That's eight hundred acre feet. And then 50-acre feet, same thing up to 50 feet high. So one's roughly 20 times greater than the other.

MR. VERNON LEE: Please, once more. If I understand what I'm saying: Does the reservation, do we have to buy water from outside sources?

MR.

VERNON LEE: The water is not coming from outside the reservation?

MR. RANDY SCHROEDER: No. The reservation is providing the water.

MR. VERNON LEE: Uh-huh.

MR. RANDY SCHROEDER: The reservation's water they're providing to the project.

MR. VERNON LEE: Is that right? Wow.

MR. DANIEL MENAHEM: To clarify, the reservation owns 25-acre feet of surface water and the rights of 25-acre feet to groundwater. We're looking to tap the groundwater.

MR. RANDY SCHROEDER: Anyone else?

Well, we do have these posters set up here, and there will be people around the room to answer any more detailed and specific questions you might have. Yes?

THE SPEAKER: What are we going to do with the Desert Tortoise that are found in the area? Are the Desert Tortoise going to be relocated or just stay kept in this area?

MR. RANDY SCHROEDER: Well, that's one of the things we'll be working through with the Fish & Wildlife Service to determine whether or not the Desert Tortoise need to be translocated or if the Desert Tortoise can be dealt with in place. That's part of that process, yeah. Okay.

If no one else has any other questions, then like I said, feel free to stick around and ask some questions. More details on the project itself. And then the process over here that Amy was talking about. Yes, sir?

MR. VERNON LEE: Me? Yes. I heard, also, the woman that drilled the wells here, I heard that the woman had to cut them off and cut them off, made the wells less? I heard. I don't know for true. I heard that.

MR. RANDY SCHROEDER: Yeah, I don't know anything about that.

MR. VERNON LEE: I just know the wells, I had to check the wells. I don't know how many wells there are. I won't know.

MR. RANDY SCHROEDER: Okay. Okay. Thank you all very much. And like I said, stick around to ask some questions.The proceedings concluded at 6:28 P.M. Page 42 Sousa Court Reporters 702-765-7100

STATE OF NEVADA

COUNTY OF CLARK

I, DONNA J. ABRAHAMSEN, a Certified Court Reporter, do hereby certify:

That prior to being examined, the witness in the foregoing proceedings was by me duly sworn to testify to the truth, the whole truth, and nothing but the truth;

That said proceedings were taken before me at the time and place therein set forth and were taken down by me in shorthand and thereafter transcribed into typewriting under my direction and supervision;

I further certify that I am neither counsel for, nor related to any party to said proceedings, nor in anywise interested in the outcome of said proceedings.

In witness whereof, I have hereunto subscribed my name

Dated: , 2012

, RPR

NV CCR NO. 420, CA CSR NO. 9652 WA. CCR NO.Certainly! Here is a revised version of the text with coreference resolution applied:

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3262 aA 25

117 Deposition of: Moapa Public Meeting U.S. Bureau of Indian Affairs & The Moapa Band of Paiute Indians Page 44 A Allen 14:1 28:1 29:2 aware 19:16 34:15 10:22 14:24 20:16 29:5 33:23,25 36:7 Aaron 36:11,11,14,14 32:11 38:16,20 23:12 26:2 27:1 35:3 37:22 37:4,11,17,20,24 38:2 allotments 16:16 35:11 comes 37:21 able 22:25 allottees 23:20,20 B Bureau's 20:3 coming 5:8 8:17 34:13 Abrahamsen 1:24 2:3 allowing 13:14 back 9:1 12:9,14 14:9 busy 16:20 comment 12:13,16 43:4,22 American 35:7,16 14:12 15:19 16:25 buy 41:11,11 25:14 26:10,11 33:23 AC 31:23 amount 40:8,10 17:4 25:6 26:11,21 38:22 access 14:3,4 27:22 Amy 2:10 8:17 9:25 30:16,23 32:22 33:4 C comments 12:14 25:12 28:6,8 29:11,15,18,22 10:3 11:13 13:4 33:10 CA 1:24 43:23 26:9,15 34:3 32:11 26:25,25 27:5,20 33:6 background 14:20 16:9 California 16:13 35:12 Commission 35:12 accomplish 19:2 33:9 34:18 37:2,8 ball 40:24 call 9:22 16:23 17:3 communications 12:22 accounts 22:19 40:20,24 42:13 Band 2:7 3:25 10:2 18:24 20:10 24:10 company 14:18 35:8 acquisitions 20:10 analyze 22:14 13:10,19 14:16 23:18 called 6:24 15:25 17:17 38:16 acre 40:17,21,21 41:4,4 Anderson 2:7 3:4,22,24 23:19 calling 17:17 25:8 comparison 40:20 41:5,6 13:13 35:6 Base 11:21 23:16 Calvin 5:11 compliance 10:12 acres 16:15 28:13 animals 5:1 7:17 basically 4:22 5:18 camera 16:7 11:25 15:1 20:5,18,23 29:21 Anna 40:12 13:19 25:2 30:9 Cantley 2:15 10:18 35:20 acronyms 16:23 annual 20:17 basis 18:5 card 26:11 comply 20:20 21:3 Act 16:22 17:8 18:11 answer 9:3 34:23 37:8 believe 35:7 37:9 cards 12:13,16 component 31:1,22 19:4,5,10 41:25 benefits 14:15 27:14 care 7:16,17 components 29:23 action 11:24 13:17 anymore 41:25 best 6:13 carefully 3:20 concentrated 4:15 22:3 actions 11:22 20:2,9,16 Anytime 20:3 better 21:11 carried 31:24 30:7 35:13 active 35:13 anywise 43:14 BI 10:16 16:8 21:9 case 21:5 23:12 31:20 concentrating 24:7 activities 15:13,14 20:2 APPEARANCES 2:6 BIA 7:13 8:11 9:8 39:7 30:4 40:16 20:4,13 22:18,23 applicants ...

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This is an extensive excerpt and requires substantive work for coreference resolution and revision while maintaining nouns and verb agreement for each identified coreference. If there's any more specific part of the text you'd like me to focus on for coreference resolution and substitution, let me know, and I'll be glad to assist further!The meeting commenced with an open house of approximately 30 minutes. The formal presentation began at approximately 6:00 PM, and attendees were seated. Brief introductory remarks were made by Brenda Wilhight, BLM Realty Specialist Renewable Energy Office at the Las Vegas meeting. The program opened with Chairman William Anderson of the Moapa Band of Paiute Indians. Chairman William Anderson gave a brief history of the Reservation, what Chairman William Anderson envisions will be the future of the Moapa Band of Paiute Indians and the importance of the Proposed Action to the community of Paiute Indians. Chairman William Anderson then turned the presentation over to Ms. Kellie Youngbear, who introduced herself and Ms. Kellie Youngbear's agency staff. Following Ms. Kellie Youngbear, BIA Regional Environmental Protection Officer, Amy Heuslein introduced BIA and BLM staff and explained the various ways to provide comments. Amy Heuslein gave a presentation explaining the purpose and need of the EIS, EIS schedule, and the NEPA process. ENValue Project Manager, Randy Schroeder of the EIS consultant team, presented the Proposed Action with an overview of the technical aspects and the environmental issues already identified to be addressed in the Draft EIS. Following the presentation, Randy Schroeder concluded the meeting with a public comment session inviting the public to provide verbal comments on the Proposed Action. Detailed notes were taken to record the public comments expressed. The following are verbal public comments received at the formal portion of the scoping meeting: 14-ALT1 1. Rob Morwka with the Center for Biological Diversity asked to explain why there is a need for transmission lines to go to two different substations. Rob Morwka asked if both transmission lines would be built. Randy Schroeder with ENValue responded that only one transmission line to one substation would be built, but both alternatives are being considered in the EIS. One proposed transmission line corridor would go due south from the project site, crossing BLM lands, where the transmission line corridor would intercept all of the existing lines out there which follow down to the Harry Allen Power Plant. The second proposed transmission line would follow the southern boundary of the reservation to a point due north of the Crystal Substation, then the transmission line would cross BLM lands to connect from there. 14-VIS 1 2. Jim Callahan with Nellis Air Force Base asked how tall the transmission lines will be. Randy Schroeder responded for the 230kV line, the lines would average 120 feet tall and for the 500 kV line, the lines would average 140 to 150 feet tall. All of these heights would vary depending on topography. 3. Bill Codwallander with Nellis Air Force Base asked where the K Road solar project is in relationship to the Moapa Solar Energy Project. Randy Schroeder responded the K Road solar project is located to the north east of the proposed project and is adjacent to Interstate 15. 14-WAT 4. Rob Morwka asked if Randy Schroeder has an estimate of the amount of groundwater that would be used for the project. Randy Schroeder responded for the PV portion the project would use about 50 acre-feet per year and for the CSP technology the project would use about 800 acre-feet per year. 5. Darren Dabado with the Environmental Department for the Moapa Band of Paiutes asked where the Old Spanish Trail is in relation to the project. Kathleen Sprowl with the BLM responded that there are several segments of trails in the area, and the locations will be identified during the cultural surveys for the project. The congressionally designated trail is located across Interstate 15 on the east side of the mountains and so the solar project would not be visible from the congressionally designated trail. 14-VIS 2 6. Tom Miller with Nellis Air Force Base asked what the height of the towers that would be crossing existing transmission line corridors is - how high the towers would be. Tom Miller asked how tall the receivers on the eSolar towers are. Randy Schroeder responded that the receivers on the eSolar towers are 250 feet tall. The transmission line poles would be 120 to 150 feet high depending on topography and kV of the line. 14-CUM 7. Rob Morwka expressed concern with cumulative impacts of K Road and other projects in the area combined with the Moapa Solar Energy project. Randy Schroeder responded that the cumulative effects analysis would consider all proposed, existing, and past projects in the area. This information would be contained in the EIS. 14-OTH 1 8. Christopher Caswell asked if the total megawatt generated from the PV is a certainty and which technology would be part of the Project.Mr. Schroeder responded the photovoltaic solar panels would generate up to 100 megawatts. Another 100 megawatts could be generated from concentrated solar power. Moapa Solar Energy Center EIS Public Scoping Meeting Summary August 22, 2012 BLM Conference Room, 4701 N. Torrey Pines, Drive Las Vegas, NV Page 2

Rob Morwka stated that the project sounds speculative. Morwka asked when the Power Purchase Agreement is going to be in place. Morwka expressed concerns that the location of the transmission line routes is unknown. Morwka inquired how the analysis would be conducted for tortoise and groundwater cumulatively without knowing the transmission line route's location. Daniel Menahem with RES Americas responded that the Power Purchase Agreement should be in place within the next 12 months. Mr. Schroeder responded that both transmission line routes would be included and analyzed in the cumulative effects analysis for tortoise and groundwater. After the conclusion of the verbal comments from the public, the meeting transitioned into an open house format. Agency representatives were on hand to answer questions. Members of the public were invited to view the project information posters, take a comment sheet, fill the comment sheet out and leave the comment sheet with meeting representatives or take the comment sheet home and mail the comment sheet in later. The meeting concluded at 7:30 P.M. Moapa Solar Energy Center EIS Public Scoping Meeting Summary August 22, 2012 BLM Conference Room, 4701 N. Torrey Pines, Drive Las Vegas, NV Page 3

"Comment Reference Document 15 From: Level 3 Network Relocations [mailto:Level3.NetworkRelocations@Level3.com] Sent: Wednesday, October 10, 2012 8:55 AM To: Hice, Vanessa L Subject: N-62093/01, N-88870, 2800 (NVS0056) Ms. Hice, Level 3 has received Vanessa Hice's letter dated 9/17/12 regarding the project at the Moapa River Indian Reservation ("Project"). After reviewing the information Vanessa Hice provided, it is uncertain whether the project will impact the Level 3 Facilities. Any sub structure or structure constructed on or near the right of way needs to have a Level 3 representative meet with and be present for this construction. Any underground or excavation activity performed near the right of way needs to have a Level 3 representative onsite. Lastly, there may be no loss of access to the Level 3 easement right of way by the construction of this facility. The Level 3 Facilities have been constructed on private property and/or public right of way with the authorization of the applicable property owner. If it is determined that an adjustment and/or relocation of the Level 3 Facilities is necessary to accommodate the project, please contact the undersigned to discuss and reference the file number 37155 NV with any future communications. Any changes or additions to the project plans or parameters should be submitted to Level 3 for review of potential new impacts to the Level 3 Facilities. Unless Level 3 receives information that such adjustment or relocation is necessary, Level 3 will assume that any potential conflict between the project and Level 3 Facilities has been eliminated.Sincerely, Matt Prink Network Relocations - Business Analyst Level 3 Communications 1025 Eldorado Blvd Broomfield, CO 80021 (Office 33A-525) p: 720-888-2639 e: Matthew.Prink@Level3.com"

128 S14 - T16S - R63E S13 - T16S - R63E S18 - T16S - R64E S17 - T16S - R64E S16 - T16S - R64E S23 - T16S - R63E S24 - T16S - R63E S19 - T16S - R64E S20 - T16S - R64E S21 - T16S - R64E S26 - T16S - R63E S25 - T16S - R63E S30 - T16S - R64E S29 - T16S - R64E S28 - T16S - R64E S35 - T16S - R63E S36 - T16S - R63E S31 - T16S - R64E S32 - T16S - R64E S33 - T16S - R64E Clark S12 - T17S - R63E S7 - T17S - R64E S8 - T17S - R64E S9 - T17S - R64E S10 - T17S - R64E S15 - T17S - R64E S13 - T17S - R63E S18 - T17S - R64E S17 - T17S - R64E S16 - T17S - R64E 13999 N US-93, Moapa, NV 89025 S24 - T17S - R63E S19 - T17S - R64E S20 - T17S - R64E S21 - T17S - R64E S22 - T17S - R64E 5 I1 S25 - T17S - R63E 5 S30 - T17S - R64E S29 - T17S - R64E I1 S28 - T17S - R64E S27 - T17S - R64E Note that the locations of Facilities shown on these drawings are only approximate and Level 3 Communications hereby disclaims any responsibility to Level 3 Communications Facilities third parties for the accuracy of this information. Persons working in the area covered by these drawings must contact the statewide Call-Before-You-Dig System to ascertain the location of underground facilities prior to performing any excavation. 129 ve Casaby A Henry Dr Rox Rd Red Cloud Dr Patriots Way Leona Ave S34 - T14S - R66E Rox Rd Moapa Town Clark Barlow Ave Barlow Ave & Rox Rd, Moapa, NV, 89025 Sta te Hw y1 68 Sta te Hw y1 68 S3 - T15S - R66E Note that the locations of Facilities shown on these drawings are only approximate and Level 3 Communications hereby disclaims any responsibility to Level 3 Communications Facilities third parties for the accuracy of this information. Persons working in the area covered by these drawings must contact the statewide Call-Before-You-Dig System to ascertain the location of underground facilities prior to performing any excavation. 130 Comment Reference Document 16 132 Comment Reference Document 17 133 Appendix B Policies, Plans, and Laws that could apply to the Proposed Project 134 APPENDIX B POLICIES AND PROGRAMS The following sections summarize the Federal, State, and local policies, plans, and laws that apply to the Proposed Project. The Proposed Project would be located on Tribal lands and Federal lands managed by the Bureau of Land Management (BLM). The Federal actions to be taken by the Bureau of Indian Affairs (BIA) and Bureau of Land Management require compliance with the National Environmental Policy Act (NEPA). The portions of the Proposed Project located on Bureau of Land Management and lands on the Reservation and within the Bureau of Land Management managed utility corridor must comply with applicable Federal, State, and local rules and policies that apply to Bureau of Land Management. The portion of the Proposed Project on the Reservation would be under the jurisdiction of the Tribe's Environmental Policy Ordinance. Below is a summary of local, State and Federal laws and regulations that could apply to the Proposed Project. GENERAL National Environmental Policy Act (NEPA) NEPA requires Federal agencies to review the effects of Federal agencies' actions on the natural and human made environment prior to taking action. The law requires all Federal agencies to consider the direct, indirect, and cumulative effects of proposals and reasonable alternatives prior to making a decision and to provide review by Federal, State, local, and tribal environmental authorities, as well as by other affected parties and interested citizens.Federal Land Policy and Management Act (FLPMA) The Federal Land Policy and Management Act (FLPMA) (43 U.S.C. 1761(a)) governs the way that public lands administered by the BLM are managed. The Federal Land Policy and Management Act is designed to allow a variety of uses on BLM-administered Federal lands while simultaneously trying to preserve and manage the natural resources on BLM-administered Federal lands. BLM must respond to the Applicant's application under Title V of the Federal Land Policy and Management Act for ROW grants to construct, operate, maintain, and decommission electric transmission line(s), water pipeline, and access road ROWs on BLM-administered land pursuant to 43 CFR 2800. Executive Order 11514 (National Environmental Policy Act) This order requires Federal agencies to continually monitor and control Federal agencies' activities to protect and enhance the quality of the environment. Executive Order 11514 also requires Federal agencies to develop procedures to (1) ensure that the public is informed and understands the Federal plans and programs with potential environmental impact and (2) obtain the views of interested parties. Moapa Band of Paiutes Tribal Environmental Policy Ordinance The Moapa Band of Paiutes Business Council developed the Tribal Environmental Policy Ordinance to support the Tribal Government, in cooperation with Federal, State and local governments, and other concerned public and private organizations, to use all practicable means and measures to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Tribal members. Under this ordinance, the Moapa Band of Paiutes Tribe will study the environmental impacts of major projects using a systematic, interdisciplinary approach to insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment. Moapa Utility Corridor and the Moapa Act The Moapa Utility Corridor and the Moapa Act (Public Law 96-491-Dec. 2, 1980) reserved portions of a designated utility corridor on the Reservation to BLM jurisdiction. Utilities located within this corridor would require a ROW authorization by BLM in accordance with Title V of the Federal Land Policy and Management Act. AIR QUALITY Clean Air Act The U.S. Environmental Protection Agency (EPA) implements and enforces the requirements of most Federal environmental laws. EPA Region 9 administers Federal air programs in Nevada, including oversight of the State of Nevada Department of Environmental Protection (NDEP) and Clark County Department of Air Quality and Environmental Management (DAQEM) which are responsible for implementing those programs within their jurisdiction. The Clean Air Act (CAA), most recently amended in 1990, provides the U.S. Environmental Protection Agency with the legal authority to regulate air pollution from stationary, area, and mobile sources. Council on Environmental Quality - Draft NEPA Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions In February 2010, the Council on Environmental Quality (CEQ) issued a draft guidance memorandum for public consideration and comment on the ways in which Federal agencies consider the effects of GHG emissions and climate change under NEPA. The guidance advises Federal agencies to consider, in scoping Federal agencies' NEPA analyses, whether analysis of the direct and indirect GHG emissions from Federal agencies' proposed actions may provide meaningful information to decision makers and the public. Clark County Department of Air Quality and Environmental Management The Clark County DAQEM has been delegated the authority, under the provisions of Nevada Revised Statute (NRS) 445B.500 and by direction of the Governor of the State of Nevada and the Clark County Board of County Commissioners, to implement and enforce an air pollution control program in Clark County, Nevada. Air quality regulations applicable to the Proposed Action on BLM lands or within the designated utility corridor on the Reservation include: cent Section 41, Fugitive Dust: This section establishes that any person engaged in activities involving grading, clearing of land, public or private construction, the operation of machines and equipment, the grading of roads, trenching operations, the operation and use of unpaved parking facilities to take all reasonable precautions to abate fugitive dust from becoming airborne from such activities. cent Section 45, Idling of Diesel-Powered Motor Vehicles: This section limits the idling of the engine of a diesel truck or a diesel bus to less than 15 consecutive minutes. cent Section 94, Permitting and Dust Control for Construction Activities: The purposes of this section are to limit the emission of particulate matter into the ambient air by preventing, controlling, and mitigating fugitive dust from construction activities. WATER RESOURCES There are no perennial surface waters in the Project area so there is no local governing water authority for the area. The management and allocation of water resources for the basin are under the authority of the Nevada Division of Water Resources (NDWR) State Engineer.###

The Clean Water Act of 1977 was enacted to restore and maintain the integrity of the Nation's water and prohibit the discharge of toxic pollutants to waters of the United States. The Clean Water Act (CWA) provides guidelines and limitations for effluent discharges from point-source discharges and provides authority for the Environmental Protection Agency (EPA) to implement the National Pollutant Discharge Elimination System (NPDES) permitting program. Section 402(p) of the Clean Water Act requires permits for storm water discharges associated with industrial activity.

### Construction General Stormwater Permit

The Clean Water Act Section 402 regulates construction-related stormwater discharges to surface waters through the NPDES program. Region 9 of the Environmental Protection Agency manages construction stormwater permits on Tribal lands. In Nevada, the Nevada Division of Environmental Protection (NDEP) has been delegated the authority by the Environmental Protection Agency to administer the NPDES program through the Bureau of Water Pollution Control for other Federal lands. The construction stormwater permit is required for all sites greater than 1 acre. This permit requires the preparation of a Stormwater Pollution Prevention Plan (SWPPP) during construction. Nevada does not have specific regulations pertaining to the treatment of fuel spills during construction. All petroleum-contaminated materials must be disposed of in accordance with applicable State and local regulations.

### Section 404 Permitting

Section 404(a) of the Clean Water Act authorizes the U.S. Army Corps of Engineers (USCOE) to issue permits regulating the discharge of dredged or fill material into the waters of the United States, including wetlands. The main premise of the Section 404 regulatory program is that no discharge of dredged or fill material can be permitted if a practicable alternative exists which is less damaging to the environment.

### Section 401 Permitting

Some Section 404 permits issued by the U.S. Army Corps of Engineers require that a water quality certification be obtained. In Nevada, Section 401 permitting is the responsibility of the Nevada Division of Environmental Protection, Bureau of Water Quality Planning, and to the Environmental Protection Agency on Reservation land.

### Safe Drinking Water Act

The Safe Drinking Water Act's primary objective is to protect the quality of public water supplies and all sources of drinking water. The State of Nevada regulates public drinking water supplies in Nevada and enforces drinking water standards and implements aquifer and water source protection regulations.

### National Flood Insurance Program (NFIP)

The National Flood Insurance Program is administered by the Federal Emergency Management Agency (FEMA) and is designed to reduce future flood risks to new construction in Special Flood Hazard Areas. In support of the National Flood Insurance Program, the Federal Emergency Management Agency identifies flood hazard areas throughout the United States and its territories by producing Flood Hazard Boundary maps, Flood Insurance Rate maps, and Flood Boundary and Floodway maps.

### Floodplain Management

The Clark County Regional Flood Control District has a comprehensive floodplain management program in place that includes a regulatory program that establishes standards and requirements for flood hazard management. These regulations outline when and where Floodplain Use Permits are required.

### Executive Order 11988 (Floodplain Management)

Executive Order 11988 requires Federal agencies to establish procedures to ensure that the potential effects of flood hazards and floodplain management are considered for actions undertaken in a floodplain. The order also requires that floodplain impacts be avoided to the extent practicable.

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### CULTURAL AND HISTORIC RESOURCES

### National Historic Preservation Act

The National Historic Preservation Act of 1966 provides that sites with significant national historic value be placed on the National Register of Historic Places. This act requires evaluation of whether a Federal activity could impact a historic property resource. If a Federal activity could impact a historic property resource, consultation with the Advisory Council on Historic Preservation will be required that identifies mitigation to minimize adverse impacts. Coordination with the State Historic Preservation Officer is also undertaken to ensure that potentially significant sites are properly identified and appropriate mitigative actions implemented.

### Archaeological Resources Protection Act

The Archaeological Resources Protection Act of 1979 protects archaeological resources located on U.S. public lands and American Indian lands. The requirements concerning protection of archaeological resources would be addressed prior to site disturbances by consultation with the Department of Interior Advisory Council on Historic Preservation and the State Historic Preservation Officer.

### American Indian Religious Freedom Act

The American Indian Religious Freedom Act of 1978 is a policy Statement intended to reaffirm American Indian rights regarding religious freedom. The purpose of the American Indian Religious Freedom Act is to ensure that American Indians have access to and protection of physical locations and resources that are sacred and sometimes required for the practice of American Indian religious rites and ceremonies.

### Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act of 1990 governs ownership or control of American Indian remains and cultural items which are excavated or discovered on Federal or tribal lands.

### Antiquities Act

The Antiquities Act of 1906 protects historic and prehistoric ruins, monuments, and antiquities, including paleontological resources, on Federally controlled lands.\*\*Paleontological Resources Preservation Act\*\* The Paleontological Resources Preservation Act (PRPA) provides protection for vertebrate (i.e., animals with backbones) paleontological resources on Federal lands by limiting the collection of vertebrate fossils and scientifically important fossils to permitted and qualified researchers.

\*\*National Trails System Act\*\* The National Trails System Act supports the designation and management of National trails near urban areas and within scenic areas and along historic travel routes often more remotely located.

\*\*BIOLOGICAL RESOURCES\*\*

\*\*Endangered Species Act\*\* The Endangered Species Act (ESA) of 1973, as amended, is intended to prevent the further decline of endangered and threatened species and to restore endangered and threatened species and their habitats. Section 7 of the Endangered Species Act requires consultation by Federal agencies to determine whether endangered and threatened species are known to have critical habitats onsite or in the vicinity of any proposed action.

\*\*Fish and Wildlife Coordination Act\*\* The Fish and Wildlife Coordination Act promotes more effectual planning and cooperation between Federal, State, public, and private agencies for the conservation and rehabilitation of the nation's fish and wildlife and authorizes the U.S. Department of Interior to provide assistance.

\*\*Migratory Bird Treaty Act\*\* The Migratory Bird Treaty Act of 1918 governs the taking, killing, or possession of migratory birds.

\*\*Bald Eagle Protection Act\*\* The Bald Eagle Protection Act of 1940 protects bald and golden eagles by prohibiting the taking, possession, and commerce of bald and golden eagles and establishes civil penalties for violations.

\*\*Public Lands - Wild Horses and Burros Act\*\* The Public Lands - Wild Horses and Burros Act requires the protection, management, and control of wild free-roaming horses and burros on public lands. Wild free-roaming horses and burros are prohibited from capture, branding, harassment, or death and wild free-roaming horses and burros are to be considered an integral part of the natural system of the public lands.

\*\*Executive Order 13112 - Invasive Plants and Noxious Weeds\*\* Invasive plants and noxious weeds are managed on public lands by the Bureau of Land Management (BLM) under the direction of the National Invasive Species Council (NISC) established in 1999 (Executive Order 13112). Much of the management of invasive plants and the listing of noxious weeds is also regulated by the U.S. Department of Agriculture (USDA) under the Federal Noxious Weed Act.

\*\*Nevada Revised Statute 527.060-527.120\*\* Nevada Revised Statute (NRS) 527 protects and regulates the removal of Christmas trees, yuccas, and cacti for commercial purposes. Such removal or possession requires a permit and tags from the Nevada Spur Forester Fire Warden, Nevada Division of Forestry. Chapter 527 also gives the Nevada Natural Heritage Commission the ability to protect native flora by listing native flora on the Nevada Natural Heritage Commission's protected species list.

\*\*Nevada Revised Statute 501\*\* Nevada Revised Statute 501, supplemented by the Nevada Administrative Code, covers administration and enforcement of wildlife resources within the State. The administering agency is the Nevada Department of Wildlife (NDOW). Any authorizations for impacts to protected species would be processed through the Nevada Department of Wildlife.

\*\*LAND USE\*\*

\*\*BLM Las Vegas Resource Management Plan\*\* The Las Vegas Resource Management Plan (LVRMP) contains the land management direction for resources within this area compliant with the Federal Land Policy and Management Act of 1976 (FLPMA). The Las Vegas Resource Management Plan includes right-of-way (ROW) development guidelines for the authorization of rights-of-way on public lands for a variety of uses including electrical transmission lines, electrical power plants and substations, and related power distribution lines. The Las Vegas Resource Management Plan emphasizes protecting unique habitats for threatened, endangered, and special status species, while providing various uses including recreation, community growth, and mineral exploration and development (BLM 1998a).

\*\*Clark County Comprehensive Plan\*\* The Clark County Comprehensive Plan provides long-term planning goals and policies for Clark County's future growth. The Clark County Comprehensive Plan has goals and policies related to land use, energy, and utilities. Clark County's Utilities Policy UT 1-6 encourages the development of transmission capability and interconnectivity for distributed energy, cogeneration, and alternative energy sources, including regional interconnectivity and transmission capability. Energy Policy CV7-1.6 states that Clark County supports partnerships and cooperation with local, regional, and Federal agencies to further promote energy conservation and efficiency, renewable energy projects, and sustainable development (Clark County 2006).

\*\*Federal Aviation Administration\*\* Federal Aviation Administration (FAA) regulations address potential aircraft obstruction for structures taller than 200 feet or within 20,000 feet of an airport. Specifically, Federal Regulation Title 14, Part 77, establishes standards and notification requirements for objects that have the potential to affect navigable airspace.

\*\*SOCIAL/ECONOMIC\*\*

\*\*Executive Order 12898 (Environmental Justice)\*\* Executive Order 12898 directs Federal agencies to identify and address disproportionately high and adverse human health or environmental effects of Federal agencies' programs, policies, and activities on minority populations and low-income populations in the United States.\*\*Executive Order 13166\*\*

Executive Order 13166 requires all recipients of Federal funds to provide meaningful access to persons who are limited in their English proficiency (LEP).

\*\*HUMAN HEALTH AND HAZARDOUS MATERIALS\*\*

\*\*Occupational Safety and Health Act\*\*

The Occupational Safety and Health Act of 1970 establishes the authority for assuring safe and healthful working conditions for employees.

\*\*Hazardous Waste and Solid Waste Amendments Act\*\*

The Hazardous Waste and Solid Waste Amendments Act of 1984 are amendments to the Resource Conservation and Recovery Act (RCRA) that address waste minimization, land disposal of hazardous wastes, and underground storage tanks.

\*\*Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)\*\*

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 provides a statutory framework for the cleanup of waste sites containing hazardous substances. The Superfund Amendments and Reauthorization Act provides an emergency response program in the event of a release (or threat of a release) of a hazardous substance to the environment.

\*\*Toxic Substances Control Act\*\*

The Toxic Substances Control Act of 1976 provides the Environmental Protection Agency (EPA) with the authority to require testing of both new and old chemical substances entering the environment and to regulate the chemical substances where necessary. The Act also regulates the treatment, storage, and disposal of certain toxic substances not regulated by the Resource Conservation and Recovery Act or other statutes, particularly polychlorinated biphenyls (PCB), chlorofluorocarbons, and asbestos.

\*\*Executive Order 12856 (Right-to-Know Laws and Pollution Prevention Requirements)\*\*

Executive Order 12856 requires all Federal agencies to reduce and report toxic chemicals entering any waste stream; improve emergency planning, response, and accident notification; and encourage clean technologies and testing of innovative prevention technologies.

\*\*Appendix C Draft Weed Management Plan\*\*

\*\*Draft Weed Management Plan\*\*

Moapa Solar Energy Center August 2013

\*\*MSEC Weed Management Plan\*\*

\*\*1. INTRODUCTION\*\*

1.0 INTRODUCTION

Moapa Solar Power, LLC (Moapa Solar) proposed to construct and operate the Moapa Solar Energy Center (MSEC). The Moapa Solar Energy Center will include a variety of major components, including the Solar Power Generating Facility (SPGF), an onsite substation, a gen-tie transmission line, a water pipeline, and access road. The proposed project site is in Clark County Nevada approximately 20 miles northeast of Las Vegas, Nevada. The Moapa Solar Energy Center would be located on 850 acres of leased land on the Moapa River Indian Reservation. The associated gen-tie lines would occur on lands administered by the Tribe and by the Bureau of Land Management (BLM). The proposed access road would be located on Bureau of Land Management lands and the associated water pipeline would be located on lands administered by the Tribe. 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 (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 increase, 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 Moapa Solar Energy Center project in Clark County, Nevada, and the focus of this weed management plan. The Bureau of Land Management Southern Nevada Field Office manages all weeds on this state list on lands managed by the field office.

\*\*1.1 Purpose of this Plan\*\*

The purpose of this plan is to describe methods to prevent, mitigate, and control the spread and establishment of weeds during the implementation of the project. The project proponent and the project proponent's approved contractors would be responsible for implementing the aspects of this plan.This weed management plan is applicable to the construction, operation, and decommissioning of the proposed project. 1|Page" 144 MSEC Weed Management Plan

1. INTRODUCTION

1.2 Goals and Objectives

The goal of this weed management plan is to reduce the establishment and spread of weeds during the construction and operation phases of the proposed project. The objectives of this weed management plan include working with relevant agencies to control weeds in the project area, understand the type and distribution of weeds in the project area, and to implement effective control and monitoring efforts toward reducing the spread and establishment of weeds in the project area.

1.3 Project Description

1.3.1 Project Area

The proposed project would be located approximately 20 miles northeast of Las Vegas in Clark County, Nevada (Figure 1). The main project site, including the Solar Power Generating Facility (SPGF), would be located on 850 leased acres within the Reservation in Mount Diablo Meridian, Township 16 South, Range 64 East, Sections 29, 30, 31, and 32. Portions of the gen-tie lines and access road would be located on lands administered by the Tribe and BLM. A water pipeline associated with the proposed project would be located on Reservation lands north and east of the Solar Power Generating Facility. Figure 2 shows the location of the proposed project and associated facilities. The proposed project 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 (Mac et al 1998). These features of the Basin and Range physiographic province are visible at the proposed project site, with nearly parallel mountain ranges on the western and eastern sides of the proposed project site and a broad and gently sloping valley between. The proposed project site occurs in the Mojave Desert Scrub biome and is dominated by plants common to this biome, including creosote bush (Larrea tridentata), and white bursage (Ambrosia dumosa).

1.3.2 Proposed Project

The following sections describe the major features of the proposed project. For a comprehensive description of the proposed project, refer to the associated environmental impact statement (EIS).

Solar Power Generation Facility

The Solar Power Generating Facility would be located wholly on lands within the Reservation. The Solar Power Generating Facility would be developed using photovoltaic (PV) technology and would generate up to 200 Megawatts (MWs) of energy.

Onsite Substation

A substation with medium voltage (12.5-kV or 34.5-kV) to high voltage (230-kV/500-kV) step-up transformer(s) with mineral oil, breakers, buswork, protective relaying, supervisory control and data acquisition (SCADA), and associated substation equipment would be located on the site. The substation will be fenced for safety per codes, and one or more structures may be outside the fence for meters and control equipment.\*\*Page 2\*\*

\*\*145\*\* NEVADA UTAH Lincoln Nye County County PROJECT LOCATION 168 Inyo Clark County County ARIZONA Mohave CALIFORNIA County San Bernardino County Moapa River Indian Reservation CLARK COUNTY 93 Proposed Solar 15 Site Boundary 40 95 North Las Vegas 157 215 15 215 167 95 95 147 Las Vegas 579 515 Legend Interstate US/ State Highway Moapa Solar Energy Center Railroad Municipal Boundary 0 2 4 6 8 10 FIGURE 1 Proposed Solar Site PROJECT LOCATION Boundary Miles Universal Transverse Mercator Map Extent: Clark County, Nevada Jurisdictional Land Ownership North American Datum 1983 Zone 11 North, Meters Date: 04-30-13 Author: djb Indian Reservation I:\Moapa Solar/MXD's/Project Location 8.5x11 043013\_Moapa Weed Management Figure 1.mxd

\*\*146\*\* 93 16 15 14 13 18 17 16 15 14 17 NEVADA UTAH Lincoln Nye County County PROJECT LOCATION Mohave 24 19 21 22 23 22 County 23 20 20 Inyo Clark County County 21 ARIZONA Proposed Water T16S R64E CALIFORNIA Pipeline Route San Bernardino County 28 25 30 27 26 28 27 26 29 29 34 T16S R63E Proposed 500kV 35 36 31 32 33 32 33 34 Gen-Tie Route 35 Crystal Proposed Solar Substation 09 Site Boundary 08 09 11 10 10 12 11 07 12 CLARK COUNTY 93 17 16 15 14 13 15 14 13 18 16 T17S R63E 22 23 Proposed Access 24 23 24 19 20 21 21 22 Road rd Proposed 230kV leva Gen-Tie Route Bou 26 25 Las 29 28 27 28 27 26 25 30 15 Veg T17S R64E as 33 34 35 36 34 35 36 31 33 32 Harry Allen 01 Power Plant 03 Harry Allen 02 04 02 01 05 04 T18S R63E 06 05 T18S R64E 03 Substation Legend Interstate Township/Range Boundary US/State Highway Section Line Local Road Existing Substation Railroad Boundary Moapa Solar Energy Center Proposed Solar Proposed Water Site Boundary Pipeline 0 0.5 1 1.5 FIGURE 2 Jurisdictional Land Proposed 230kV Ownership PROPOSED PROJECT FACILITIES Gen-Tie Miles Proposed 500kV Bureau of Land Universal Transverse Mercator Gen-Tie Management Map Extent: Clark County, Nevada Land North American Datum 1983 Zone 11 North, Meters Proposed Access Indian Reservation Date: 04-30-13 Author: djb Road I:\Moapa Solar/MXD's/Proposed Project Facilities 8.5x11 043013\_EIS Figure 2-1.mxd

\*\*147\*\* "MSEC Weed Management Plan

1. INTRODUCTION

The communication system for the substation may include above or below ground fiber optic cable or microwave tower. The project will be interconnected to the regional transmission system from the on-site substation/switchyard via the gen-tie interconnections described in subsection below.

Gen-Tie Transmission Line and Interconnections

The construction of a new transmission line is necessary to deliver the power generated by the proposed project to the electrical grid. One or two gen-tie transmission lines will be constructed based on the customer for the power generated at the SPGF. The customer will determine whether the power generated by the SPGF will be delivered to either the Harry Allen Substation (via a 230 kV transmission line) or the Crystal Substation (via a 500 kV transmission line) as different entities can be accessed from each location. The 230 kV or 500 kV transmission line will originate at the Project substation located on the SPGF site.

The gen-tie lines would consist of the following:

Approximately 7.1 miles of single-circuit 230-kV overhead transmission line from the SPGF to the Harry Allen 230-kV Substation

Approximately 1.6 miles of single-circuit 500-kV overhead transmission line from the SPGF to the 500 kV Crystal Valley Substation (the configuration of the line near the substation is dependent on the results of NV Energy's facility studies and guidance from the studies as to where the transmission line would enter the substation).The 230 kV line to Harry Allen would head south from the SPGF site for approximately 2.5 miles until meeting an existing 500-kV transmission line. The proposed transmission line would then follow, on the north side, the existing transmission line for approximately 3.8 miles and then stay north of the Harry Allen 500-kV Substation. Approximately 0.3 mile past the Harry Allen 500-kV Substation, the proposed line would cross an existing 500-kV transmission line at a 90-degree angle and proceed for another 0.4 mile before turning northeast and connecting into the Harry Allen 230-kV Substation on the north side of the Harry Allen 230-kV Substation. This route is approximately 7.1 miles long. The maintenance road associated with the existing 500 kV line will be used to the extent possible for construction and maintenance of the proposed 230 kV transmission line. The design, construction, operation, and maintenance of the transmission lines will 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 will 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 the Avian Power Line Interaction Committee's more recent publication "Reducing Avian Collisions with Power Lines" (APLIC 2012).

The Project would require vehicular access for construction, operation, and maintenance. A 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15 would be constructed on BLM-administered lands. From the existing paved frontage road west of I-15, the proposed site access road would follow an existing dirt road for approximately 2.0 miles until the access road reaches the proposed 230 kV gen-tie transmission line ROW which the proposed site access road would follow approximately 0.5 mile north to the SPGF site. The access road would be designed to accommodate equipment deliveries, the construction workforce, and, ultimately, the operational needs of the Project. The surface of the access road is proposed to be 24 feet wide, would be two lanes, and would have adjacent shoulders and drainage swales on either side. The Applicant has requested a 100-foot-wide ROW so the existing road can be straightened if needed in some places. Final design for the access road would be consistent with BLM and Clark County road standards. The access road would be maintained as part of the Project.

The Project's fire protection water system will be supplied from a dedicated raw water storage tank, holding a minimum of 2-hours of full flow runtime, located on the plant site. One electric and one diesel-fueled backup firewater pump will be installed to deliver water to the fire protection water-piping network. Fire protection pump flowrates will be in accordance with applicable standards. A smaller electric motor-driven jockey pump will maintain pressure in the fire protection water-piping network. If the smaller electric motor-driven jockey pump is unable to maintain a set operating pressure in the fire protection water-piping network, a main fire protection pump starts automatically. All fire protection system pumps must be shut off manually. The fire protection water-piping network will 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 will be located throughout the plant site.

A weed survey of the project site, including the routes for the transmission lines, pipeline, and the access road, will be conducted prior to conducting surface disturbing activities. The weed survey will be focused on identifying and mapping occurrences of weed species described in the Nevada Revised Statues 555.005, Appendix A. Occurrences of cheatgrass (Bromus tectorum), red brome (Bromus rubens), halogeton (Halogeton glomeratus), Russian thistle (Salsola kali), revennagrass (Saccharum ravennae), ripgut brome (Bromus diandrus), and Mediterranean grass (Schismus spp.) will also be identified and described, although not listed as a noxious weed by the State of Nevada. The State of Nevada has not categorized or designated these species as noxious weeds because these species' 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 this initial weed survey.The results of the weed survey will contribute to the identification of problem areas within the proposed project site. The weed survey 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 identified weed 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 so as to indicate to construction personnel that such areas are to be avoided until appropriately treated.

The weed management plan for the MSEC project will include the 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.

Preventative measures will be implemented as 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 site will be washed 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 are 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 before and immediately prior to departing 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 area will be restricted to designated roads and established overland travel routes.

Additionally, on Bureau of Land Management (BLM) lands, all weed stipulations for construction projects developed by BLM will be implemented (Appendix E).

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 site. The proposed project site occurs within suitable and occupied desert tortoise habitats. As such, the application of herbicides may be permitted, though a Pesticide Use Proposal (PUP) would need to be submitted to the Bureau of Land Management (BLM) prior to herbicide use. Mechanical treatments include the use of physical means to remove plants, reproductive parts, or propagules. Mechanical treatments include 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 area and other factors, biological controls are not expected to be a viable or appropriate alternative for treating weed occurrences at the proposed site.

The Bureau of Land Management (BLM) regulates the use and type of herbicides on all of the Bureau of Land Management's administered lands.Included in the Bureau of Land Management's Final Programmatic Environmental Impact Statement Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States (BLM 2007) is a list of the 14 active herbicidal ingredients approved for use on Bureau of Land Management (BLM) lands. Appendix B includes the 2012 list of adjuvants, chemical additives intended to improve the efficacy of herbicides, approved for use on lands administered by the Bureau of Land Management. Guidelines for the use of chemical means to control vegetation on lands administered by the Bureau of Land Management are presented in the Bureau of Land Management's Chemical Pest Control Manual (BLM n.d.). These guidelines require submittal of a pesticide use proposal (PUP) and pesticide application records (PAR) for use of herbicides on lands administered by the Bureau of Land Management. Appendix C includes a Bureau of Land Management PUP submittal form, and Appendix D includes an example of a Bureau of Land Management PAR form. Pesticide use proposals (PUPs) are to be submitted to the Bureau of Land Management several weeks before herbicide application on lands administered by the Bureau of Land Management. The appropriate weed control procedures, including target species, timing of control, and method of control, will be determined through consultation with the Southern Nevada District Office (SNDO) weed specialist. All personnel associated with application of weed control measures will be appropriately trained and hold all of the required certifications. Pesticide application records (PARs) are to be submitted no more than 24 hours after application of the herbicide.

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

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, 9|Page"

MSEC Weed Management Plan 3. WEED MANAGEMENT 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 that landowner's 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."

3.3.3 Bureau of Land Management Las Vegas Field Office Weed Management Plan

The project proponent coordinated with the Southern Nevada District Office of the Bureau of Land Management to prepare this document as guidance for weed management. The methods included in the Bureau of Land Management Weed Management Plan (BLM 2006) originated from a cooperative effort between the Bureau of Land Management and other federal agencies that produced the document, Partners Against Weeds. The regulations and guidelines in the Bureau of Land Management Weed Management Plan will be generally followed and implemented on all areas of proposed disturbance throughout the project site. 10 | P a g e"

MSEC Weed Management Plan 4. WEED MONITORING

4.0 WEED MONITORING

Monitoring is the repeated collection and assessment of information toward evaluating attainment of the 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 site. Weed monitoring will be conducted by qualified biologists and appropriately trained personnel. All areas in the project area that are proposed for surface disturbance will be monitored for weeds. Monitoring will occur when weed species are most likely to be detected and can easily be identified. New or previously unidentified weed infestations identified during monitoring will be described, the locations of the new or previously unidentified weed infestations recorded using a hand-held GPS unit, and reported to the Southern Nevada District Office weed specialist.

4.1 Ongoing Monitoring

Weed monitoring will occur on an ongoing basis during implementation of the proposed project. 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 for an estimated five years or until restoration efforts are deemed complete. 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 SNDO weed specialist within two weeks of monitoring. 4.3 Monitoring of Known Infestation Area 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 a weed 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. 11 | P a g e

154 MSEC Weed Management Plan 5. HERBICIDE APPLICATION, HANDLING, SPILLS, AND CLEANUP 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. Permits may include terms and conditions that are not included in this weed management plan. 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. A PUP must be obtained from BLM prior to herbicide application. If faced with any of the following scenarios, herbicide application shall be suspended until such conditions no longer exist: cent Wind velocities in excess of 6 miles per hour (mph) during application of liquid herbicides and 15 mph during application of dry herbicides; cent Snow or ice present on weed foliage; or cent 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 ROW, or in rough, varied terrain. All herbicide applicators, spreaders and sprayers, will be calibrated before each use to ensure all application rates and procedures are appropriately implemented. Herbicide transport and handling will follow these methods: cent No herbicides will be stored onsite. cent Only the quantity of herbicide expected for each day's use will be transported. cent Herbicide concentrate will be transported in approved containers in a controlled manner so as to prevent spills. Herbicide 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. cent 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. cent Herbicides will not be applied to areas of open or flowing water, wetlands, or other sensitive resources unless authorized by the appropriate regulatory agency. cent All equipment and containers used for herbicide storage, application, and transport will be subject to inspection for leaks or damage. cent Emptied herbicide containers will be disposed 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. 12 | P a g e

155 MSEC Weed Management Plan 5. HERBICIDE APPLICATION, HANDLING, SPILLS, AND CLEANUP 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. Disseminate the appropriate onsite and agency notifications of a spill. Secure the affected area barring pedestrian and vehicle traffic. All spill response personnel shall don the appropriate PPE prior to entering the spill containment area. Spill response 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 generated spill response containers 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 site 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.

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Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Raptor Protection on Power Lines - The State of the Art in 1996. Edison Electric Institute and Raptor Research Center Foundation, Washington D.C., USA. Avian Power Line Interaction Committee (APLIC). 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and Avian Power Line Interaction Committee. Washington, D.C. Bureau of Land Management (BLM). 2006. Noxious Weed Plan, Las Vegas Field Office, Bureau of Land Management: A Plan for Integrated Weed Management. 47pp. Bureau of Land Management. 2007. Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement. Available on the internet at: http://www.blm.gov/wo/st/en/prog/more/veg\_eis.html. Accessed on March 22, 2013. Bureau of Land Management. No Date. Bureau of Land Management Manual 9011 - Chemical Pest Control. Available on the internet at: http://www.blm.gov/ca/st/en/prog/weeds/9011.html. Access on March 22, 2013. Mac, M.J., P.A. Opler, C.E. Puckett Haecker, and P.D. Doran. 1998. Status and Trends of the Nation's Biological Resources. 2 vols. U.S. Department of the Interior, U.S. Geological Survey, Reston, VA. Available on the internet at: http://www.nwrc.usgs.gov/sandt/SNT.pdf. Accessed on March 22, 2013.

APPENDICES

Appendix A - Nevada Designated Noxious Weed Species

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

State of Nevada Common Name Scientific Name 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 Hypercum 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 start thistle Centaurea iberica A

Klamath weed Hypericum perforatum A

Malta start thistle Centaurea melitensis A

Mayweed chamomile Anthemis cotula A

Mediterranean sage Salvia aethiopis A

Lythrum salicaria, L. Purple loosestrife virgatum A

Purple start thistle Centaurea calcitrapa A

Rush skeletonweed Chondrilla juncea A

Sow thistle Sonchus arvensis A

Spotted knapweed Centaurea masculosa A

Squarrose star Centaurea virgate Lam knapweed Var. squarrose 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

Carolina horse-nettle Solanum carolinense B

Diffuse knapweed Centaurea diffusa B

Leafy spurge Euphorbia esula B

Taeniatherum caput- Medusahead medusae B

Musk thistle Carduus nutans B

Russian knapweed Acroptilon repens B

Sahara mustard Brassica tournefortii B

State of Nevada Common Name Scientific Name Category

Scotch thistle Onopordum acanthium B

Silverleaf nightshade Solanum elaegnifolium B

White horse-nettle Solanum carolinense B

Canada thistle Cirsium arvense C

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 Water hemlock Cicuta maculata C A: Weeds not found or limited in distribution throughout the state; actively excluded from the state and actively eradicated where water hemlock Cicuta maculata is found; control required by the state in all infestations of water hemlock Cicuta maculata. 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 of weeds 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 Officer. 161 Appendix B - Adjuvant and Herbicide Formulas Approved by the BLM

162 Adjuvants Approved for Use on BLM Administered Lands Update: September 25, 2012 Adjuvant Adjuvant Trade Class Type Name Manufacturer Comments Surfactant Non-ionic Agrisolutions Preference Agriliance, LLC. WA Reg. No. 1381-50011 A-90 Alligare, LLC Aqufact Aqumix, Inc. Brewer 90-10 Brewer International No Foam A Creative Marketing & Research, Inc. CA Reg. No. 1050775-50015 Aquafact Crop Production Services Baron Crown (Estes Incorporated) Audible 80 Exacto, Inc. Audible 90 Exacto, Inc. N.I.S. 80 Estes Incorporated Inlet Helena Chemical Company CA Reg. No. 5905-50099-AA Spec 90/10 Helena Chemical Company Optima Helena Chemical Company CA Reg. No. 5905-50075-AA Induce Setre (Helena) CA Reg. No. 5905-50066-AA Helena Chemical Company CA Reg. No. 5905-50091-AA Activator 90 Loveland Products Inc. CA Reg. No. 34704-50034-AA LI-700 Loveland Products Inc. CA Reg. No. 34704-50035 WA Reg. No. AW36208-70004 Scanner Loveland Products Inc. CA Reg. No. 34704-50064 WA Reg. No. 34704-09003 Spreader 90 Loveland Products Inc. WA Reg. No. 34704-05002-AA UAP Surfactant 80/20 Loveland Products Inc. X-77 Loveland Products Inc. CA Reg. No. 34704-50044 Magnify Monterey AgResources CA Reg. No. 17545-50018 Elite Platinum Red River Specialties, Inc. Red River 90 Red River Specialties, Inc. Red River NIS Red River Specialties, Inc. Cornbelt Premier 90 Van Diest Supply Co. Cornbelt Trophy Gold Van Diest Supply Co. Spray Activator 85 Van Diest Supply Co. R-900 Wilbur-Ellis

163 Adjuvant Adjuvant Trade Class Type Name Munufacturer Comments Surfactant Non-ionic (cont.) Super Spread 90 Wilbur-Ellis WA Reg. No. AW-2935-70016 Super Spread 7000 Wilbur-Ellis CA Reg. No. 2935-50170 WA Reg. No. AW-2935-0002 Agrisolutions Activate Plus Winfield Solutions, LLC CA Reg. No. 9779-50004-AA WA Reg. No. 1381-09001 Agrisolutions Preference Winfield Solutions, LLC WA Reg. No. 1381-50011 Spreader/Sticker Agri-Trend Spreader Agri-Trend TopFilm Biosorb, Inc. Onside Kick Exacto, Inc. Bind-It Estes Incorporated Surf-King PLUS Crown (Estes Incorporated) CWC 90 CWC Chemical, Inc. Cohere Helena Chemical Company CA Reg. No. 5905-50083-A Attach Loveland Products Inc. CA Reg. No. 34704-50026 Bond Loveland Products Inc. CA Reg. No. 36208-50005 Bond Max Loveland Products Inc. CA Reg. No. 34704-50060 WA Reg. No. 34704-08003 Tactic Loveland Products Inc. CA Reg. No. 34704-50041-AA Widespread Max Loveland Products Inc. CA Reg. No. 34704-50061 WA Reg. No. 34704-09001 Rocket DL Monterey AgResources CA Reg. No. 17545-50019 Nu-Film-IR Miller Chem. & Fert. Corp. Nu Film 17 Miller Chem. & Fert. Corp. CA Reg. No. 72-50021-AA Nu Film P Miller Chem. & Fert. Corp. CA Reg. No. 72-50022-AA Lastick Setre (Helena) Insist 90 Wilbur-Ellis R-56 Wilbur-Ellis CA Reg. No.2935-50144 Aqua-King Plus Winfield Solutions, LLC. Surf-King Plus Winfield Solutions, LLC. 164 Adjuvant Adjuvant Trade Class Type Name Manufacturer Comments Surfactant (cont.) Silicone-based SilEnergy Brewer International Silnet 200 Brewer International Scrimmage Exacto, Inc. Bind-It MAX Estes Incorporated Thoroughbred Estes Incorporated Aero Dyne-Amic Helena Chemical Company CA Reg. No. 5905-50080-AA Dyne-Amic Helena Chemical Company CA Reg. No. 5095-50071-AA Kinetic Setre (Helena) CA Reg. No. 5905-50087-AA Freeway Loveland Products Inc. CA Reg. No. 34704-50031 WA Reg. No. 34704-04005 Phase Loveland Products Inc. CA Reg. No. 34704-50037-AA Phase II Loveland Products Inc. Silwet L-77 Loveland Products Inc. CA Reg. No. 34704-50043 Elite Marvel Red River Specialties, Inc. Sun Spreader Red River Specialties, Inc. Syl-coat Wilbur-Ellis CA Reg. No. 2935-50189 WA Reg. No. 2935-12002 Sylgard 309 Wilbur-Ellis CA Reg. No. 2935-50161 Syl-Tac Wilbur-Ellis CA Reg. No. 2935-50167 Thoroughbred Winfield Solutions, LLC. Oil-based Crop Oil Concentrate Alligare Forestry Oil Alligare, LLC Brewer 83-17 Brewer International CWR Herbicide Activator Creative Marketing & Research, Inc. CA Reg. No. 1050775-50020-AA Majestic Crown Estes Incorporated Agri-Dex Helena Chemical Company CA Reg. No. 5905-50094-AA Crop Oil Concentrate Helena Chemical Company CA Reg. No. 5905-50085-AA Power-Line Crop Oil Land View Inc. Crop Oil Concentrate Loveland Products Inc. Maximizer Crop Oil Conc. Loveland Products Inc. CA Reg. No. 34704-50059 WA Reg. No. 34704-08002 Herbimax Loveland Products Inc. CA Reg. No. 34704-50032-AA WA Reg. No. 34704-04006 Monterey M.S.O. Monterey AgResources CA Reg. No. 17545-50025 Red River Forestry Oil Red River Specialties, Inc. Red River Pacer Crop Oil Red River Specialties, Inc. Cornbelt Crop Oil Concentrate Van Diest Supply Co.

165 Adjuvant Adjuvant Trade Class Type Name Manufacturer Comments Oil-based (cont.) Crop Oil Concentrate Cornbelt Premium Crop Oil Concentrate Van Diest Supply Co. (cont.) R.O.C. Rigo Oil Conc. Wilbur-Ellis Mor-Act Wilbur-Ellis CA Reg. No. 2935-50098 Agrisolutions Prime Oil Winfield Solutions, LLC CA Reg. No. 979-50002-AA Agrisolutions Superb HC Winfield Solutions, LLC WA Reg. No. 1381-06003 Methylated Seed Oil MSO Concentrate Alligare, LLC SunEnergy Brewer International Sun Wet Brewer International Premium MSO Helena Chemical Company Methylated Spray Oil Conc. Helena Chemical Company MSO Concentrate Loveland Products Inc. CA Reg. No. 34704-50029-AA Elite Supreme Red River Specialties, Inc. Red River Supreme Red River Specialties, Inc. Sunburn Red River Specialties, Inc. Sunset Red River Specialties, Inc. Cornbelt Base Van Diest Supply Co. Cornbelt Methylates Soy-Stik Van Diest Supply Co. Hasten Wilbur-Ellis CA Reg. No. 2935-50160 WA Reg. No. 2935-02004 Super Kix Wilbur-Ellis Super Spread MSO Wilbur-Ellis Agrisolutions Destiny HC Winfield Solutions, LLC WA Reg. No. 1381-09002 Atmos Winfield Solutions, LLC Methylated Seed Oil + Inergy Crown Estes Incorporated Organosilicone Inergy Winfield Solutions, LLC Vegetable Oil Motion Exacto, Inc. Noble Estes Incorporated Amigo Loveland Products Inc. CA Reg. No. 34704-50028-AA WA Reg. No. 34704-04002 Elite Natural Red River Specialties Competitor Wilbur-Ellis CA Reg. No. 2935-50173 WA Reg. No. AW-2935-04001

166 Adjuvant Adjuvant Trade Class Type Name Manufacturer Comments Fertilizer-based Nitrogen-based Quest Setre (Helena) CA Reg. No. 5905-50076-AA Quest Helena Chemical Company CA Reg. No.

In this text, most references are product names and registration numbers. No pronouns referring to real-world entities are present, so no replacements are necessary except for hyphenation and separation of identifiers.I'm sorry, but the text you've provided seems to be a list of product names, manufacturers, and registration numbers rather than a continuous narrative or prose that would typically contain coreferences. In such lists, coreference resolution (replacing pronouns with noun phrases they refer to) doesn't typically apply, as the text doesn't appear to include pronouns or sentences with pronouns relating to earlier noun phrases.

If you have another document that contains a narrative with sentences and pronouns, I'd be happy to help with that. Feel free to provide additional text.Crosshair Wilbur-Ellis EDT Concentrate Wilbur-Ellis Agrisolutions Interlock Winfield Solutions, LLC Defoaming Agent Fast Break Agrisolutions CA Reg. No. 1381-50006-AA WA Reg. No. 1381-50006 Defoamer Brewer International Tripleline Creative Marketing & Research, Inc. CA Reg. No. 1050775-50023-AA Reverse Exacto, Inc. Foambuster Max Helena Chemical Company Fighter-F 10 Loveland Products Inc. Fighter-F Dry Loveland Products Inc. Unfoamer Loveland Products Inc. CA Reg. No. 34704-50062 WA Reg. No. 34704-09002 Foam Fighter Miller Chem. & Fert. Corp. CA Reg. No. 72-50005-AA Red River Defoamer Red River Specialities, Inc. Foam Buster Setre (Helena) CA Reg. No. 5905-50072-AA Cornbelt Defoamer Van Diest Supply Co No Foam Wilbur-Ellis CA Reg. No. 2935-50136 Diluent/Deposition Improved JLB Oil Plus Brewer International Agent JLB Oil Plus Brewer International Bark Oil EC Crop Production Services Bark Oil Crop Production Services Hy-Grade I CWC Chemical, Inc Hy-Grade EC CWC Chemical, Inc Elite Premier Red River Specialties, Inc. Elite Premier Blue Red River Specialties, Inc.

169 Adjuvant Adjuvant Trade Class Type Name Munufacturer Comments Special Purpose Diluent/Deposition Red River Basal Oil Red River Specialties, Inc. or Utility - cont. Agent (Cont.) Thinvert TRU Waldrum Specialities, Inc. Thinvert Concentrate Waldrum Specialities, Inc. In-Place Wilbur-Ellis CA Reg. No. 2935-50169 W.E.B. Oil Wilbur-Ellis CA Reg. No. 2935-50166 WA Reg. No. AW 2935-70023 Foam Marker Align Helena Chemical Company Tuff Trax Foam Concentrate Loveland Products, Inc. Trekker Trax Loveland Products, Inc. Red River Foam Marker Red River Specialties, Inc. R-160 Wilbur-Ellis Invert Emulsion Agent Redi-vert II Wilbur-Ellis CA Reg. No. 2935-50168 Tank Cleaner Wipe Out Helena Chemical Company All Clear Loveland Products Inc. Back Field Exacto, Inc. Tank and Equipment Cleaner Loveland Products Inc. Red River Tank Cleaner Red River Specialties, Inc. Elite Vigor Red River Specialties, Inc. Kutter Wilbur-Ellis Neutral-Clean Wilbur-Ellis Cornbelt Tank-Aid Van Diest Supply Co. Water Conditioning Rush Crown (Estes Incorporated) Completion Exacto, Inc. AccuQuest WM Helena Chemical Company Hel-Fire Helena Chemical Company Blendmaster Loveland Products Inc. Choice Loveland Products Inc. CA Reg. No. 34704-50027-AA WA Reg. No. 34704-04004 Choice Xtra Loveland Products Inc. Choice Weather Master Loveland Products Inc. CA Reg. No. 34704-50038-AA WA Reg. No. 34704-05005 Elite Imperial Red River Specialities, Inc. Cornbelt N-Tense Van Diest Supply Co.

170 Adjuvant Adjuvant Trade Class Type Name Munufacturer Comments Special Purpose Water Conditioning Climb Wilbur-Ellis CA Reg. No. 2935-50181 or Utility - cont. (Cont.) WA Reg. No. 2935-09001 Cut-Rate Wilbur-Ellis

171 Appendix C - Example of BLM Pesticide Use Proposal Submittal Form

176 Appendix D - Example of a BLM Pesticide Application Record Form

179 Appendix E - Weed Stipulations for Construction Projects on BLM Land

180 Weed Stipulations for Construction Projects 1. The project proponent will limit the size of any vegetation and/or ground disturbance to the absolute minimum necessary to perform the activity safely and as designed. The project proponent will avoid creating soil conditions that promote weed germination and establishment. 2. At the onset of project planning in the NEPA analysis phase, the project proponent, project lead or the SNDO noxious weed coordinator will complete the Risk Assessment Form for Noxious/Invasive Weeds. Completing the Risk Assessment Form for Noxious/Invasive Weeds will provide information about the methods of weed treatments and weed prevention schedules for the management of noxious weeds on the project footprint. The Risk Assessment Form for Noxious/Invasive Weeds will identify the level of noxious weed management necessary for stipulation 3 below. 3. The project proponent will coordinate project activities with the BLM Weed Coordinator (702---515---5295) regarding any proposed herbicide treatment.If herbicide treatment is needed, the project proponent will prepare, submit, obtain and maintain a pesticide use proposal (PUP) for the proposed action. Weed treatments may include the use of herbicides, and only those herbicides approved for use on Public lands by the BLM. 4. Before ground-disturbing activities begin, the project proponent will review the weed risk assessment and prepare a weed management plan that will inventory and prioritize weed infestations for treatment within the project footprint. Should the weeds spread beyond the project footprint as a result of project activity, then the weeds will be treated as a part of the project. This treatment will include access routes. 5. The project proponent will begin project operations in weed-free areas whenever feasible before operating in weed-infested areas. 6. The project proponent will locate pits and staging areas for the use of equipment storage, machine and vehicle parking, or any other area needed for the temporary placement of people, machinery, and supplies. These staging areas will be selected from locations that are relatively weed-free. The project proponent will avoid or minimize all types of travel through weed-infested areas or restrict major activities to periods of time when the spread of seed or plant parts is least likely. 7. BLM or the project proponent will determine equipment cleaning sites. These sites will be coordinated with the BLM. Project-related equipment and machinery (this especially includes the nooks and crannies of undercarriages) will be cleaned of all mud, dirt, and plant parts before moving into relatively weed-free areas and when leaving weed-infested sites. Seeds and plant parts need to be collected, bagged, and deposited in landfills through the waste disposal system when practical. (This requirement is not meant to apply to service vehicles that will stay on roadways avoiding weed-infested sites.) 181 8. Project workers need to inspect, remove, and dispose of weed seed and plant parts found on their clothing and equipment. Disposal methods vary depending on the project. 9. The project proponent will evaluate options, including area closures, to regulate the flow of traffic on sites where native vegetation needs to be established. 10. A Noxious weed inventory will be performed for the project footprint prior to any ground-disturbing activities. The results of this initial inventory will be incorporated into the Weed Management Plan. The type of survey needed will depend on the size of the project footprint. 11. The proponent shall be responsible for controlling all undesirable invading plant species (including listed noxious weeds and other invasive plants identified as undesirable by federal, state, or local authorities) within the boundaries of the proponent's authorization area and Bureau-authorized ancillary facilities (e.g., access and utility corridors), including all operating and reclaimed areas, until revegetation activities have been deemed successful and responsibility released by the authorized officer. Control standards and measures proposed must conform to applicable state and federal regulations. 12. The proponent shall use weed-free seed for reclamation, and other organic products for erosion control, stabilization, or revegetation (e.g., straw bales, organic mulch) must be certified weed-free. 13. The proponent is responsible for ensuring that all project-related vehicles and equipment arriving at the site (including, but not limited to, drill rigs, dozers, support vehicles, pickups, and passenger vehicles, including those of the operator, any contractor or subcontractor, and invited visitors) do not transport noxious weeds onto the project site. The proponent shall ensure that all such vehicles and equipment that will travel off constructed and maintained roads or parking areas within the project area have been power washed, including the undercarriage, since the vehicles' or equipment's last off-road use and prior to off-road use on the project. When beginning off-road use on the project, such vehicles and equipment shall not harbor soil, mud, or plant parts from another locale. Depending on the site setting, such as remoteness, or other site conditions, the operator may be required to have an on-site wash area identified and readily available. If a noxious weed infestation is known or later discovered on the project site, project-related vehicles or equipment that have traveled through such an infestation shall be power washed, including the undercarriage prior to leaving the site, at an established, identified wash area. Wash water and sediment shall be contained in an adjacent settling basin. Should any vegetation emerge in the wash area or settling basin, the vegetation will be promptly identified and appropriately controlled if found to be an undesirable invasive plant. 14. Should undesirable invasive plants become established on developed areas prior to reclamation reshaping; appropriate measures will be taken to ensure that the invasive plants are eradicated prior to reclamation earthwork. Should undesirable invasive plants become established on reshaped areas prior to reclamation seeding; appropriate measures will be taken to ensure that invasive plants are eradicated prior to seeding the site.182 Appendix D Draft Decommissioning Plan 183 DRAFT CONCEPTUAL DECOMMISSIONING PLAN MOAPA SOLAR ENERGY CENTER August 2013 1 184 TABLE OF CONTENTS 1.0 Introduction 1.1 Purpose of Decommissioning Plan 1.2 Organization of the Plan 2.0 Project Description 2.1 SPGF 2.2 Gen-Tie Transmission Lines 2.3 Access Road 2.4 Water Pipeline 3.0 Regulatory Criteria 4.0 Project Decommissioning 4.1 Pre-Decommissioning Activities 4.2 Removal of Facilities 4.3 Debris Management, Disposal, and Recycling 4.4 Hazardous Waste Management 4.5 Post-Demolition Site Stabilization 5.0 Project Decommissioning Costs and Bonding 6.0 References Figures Figure 1 - Project Location Figure 2 - Proposed Project Facilities 2 185 Acronyms Used in the Report 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 MSEC or Project Moapa Solar Energy Center Project 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 3 186 1.0 INTRODUCTION The Moapa Solar Energy Center (MSEC or Project) has been proposed by Moapa Solar LLC (Applicant) on land within the Moapa River Indian Reservation (Reservation) and on Bureau of Land Management (BLM) lands in the Mojave Desert in Clark County, Nevada. Figure 1 shows the general location of the Moapa Solar Energy Center. The Proposed Moapa Solar Energy Center would consist of a solar power generation facility (SPGF), electrical lines that would interconnect the Moapa Solar Energy Center to the regional electrical transmission grid (gen-tie lines), a water pipeline, and an access road between the SPGF and a frontage road (North Las Vegas Boulevard) along the west side of Interstate 15 (I-15). The SPGF would be located entirely on lands within the Reservation, the gen-tie lines, water pipeline, and proposed access road would be located on both Reservation and BLM-administered lands. Figure 2 shows the location of the various Moapa Solar Energy Center components. 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 Moapa Solar Energy Center. The actual actions implemented in the Moapa Solar Energy Center closure would be determined by the expected future use of the Moapa Solar Energy Center site. Therefore, a more detailed decommissioning plan would be developed in advance of the start of decommissioning activities. The Moapa Solar Energy Center is expected to operate at a minimum for the life of the Moapa Solar Energy Center's lease with the Tribe (30 years) and the term of the Moapa Solar Energy Center's Power Purchase Agreement (PPA) or other energy contracts. It is possible, because much of the needed electrical infrastructure will have been developed, the 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 site would remain in solar energy production for the foreseeable future. It is also possible that the Tribe could re-purpose the Moapa Solar Energy Center site at the termination of solar project. Certain facility components such as the access road, electrical transmission lines, water pipeline, Operations and Maintenance (O&M) building, and others could be used to support other future uses on this site. For purposes of developing this plan, it is assumed that if and when the solar Project were decommissioned, all Moapa Solar Energy Center structures and electrical equipment would be removed from the SPGF site and associated rights-of way (ROWs) and the disturbed areas would be reclaimed in accordance with the Restoration and Revegetation Plan. 4 187 1.2 Organization of the Plan This conceptual decommissioning plan addresses the following: cent Project Description cent Regulatory Criteria cent Decommissioning Activities o Pre-Decommissioning o Removal of Facilities o Hazardous Waste Management o Debris Management, Disposal, and Recycling o Post-Demolition Site Stabilization cent Project Decommissioning Costs and Bonding As mentioned earlier, because this document addresses Project actions that would occur well in the future, this document will be updated and finalized in the months prior to the scheduled decommissioning. This will ensure the final plan addresses the proposed future land use of the Moapa Solar Energy Center site and the applicable rules and regulations in place at that time. 5 190 2.0 PROJECT DESCRIPTION This section provides an overview of the proposed Moapa Solar Energy Center and the Moapa Solar Energy Center's various components. Construction is anticipated to begin in 2014 or 2015 and will occur over an approximate 2 to 3-year period. 2.1 SPGF The SPGF would be located wholly on lands within the Reservation.It would utilize photovoltaic (PV) technology and would generate up to 200 Megawatts (MWs) of energy. The photovoltaic project is expected to disturb up to the entire 850-acre SPGF site. The proposed PV project would utilize crystalline silicon or thin-film PV panels that would be mounted on single-axis trackers. The output of the PV modules is collected through one or more combiner boxes and directed to an inverter. The inverter converts the DC power to AC power, which flows to a transformer where the power is stepped up to distribution level voltage. Multiple transformers are connected in parallel via low voltage collector lines to the Project substation. The Project site would be fenced and would also include an O&M building and parking.

2.2 Gen-Tie Lines

One or two gen-tie transmission lines will be constructed based on the customer for the power generated at the SPGF. The gen-tie lines would include approximately 7.1 miles of single-circuit 230-kV overhead transmission line from the SPGF to the Harry Allen 230-kV Substation and/or approximately 1.6 miles of single-circuit 500-kV overhead transmission line from the SPGF to the 500 kV Crystal Valley Substation. These lines would be built with single steel pole structures. The 230 kV line would be located primarily on BLM lands with a small portion on the Reservation and the 500 kV line would be located on Reservation and BLM lands.

2.3 Access Road

A 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15 would be constructed predominantly on BLM-administered lands with a short segment on the Reservation.

2.4 Water Pipeline

Water for the Project would be provided by the Tribe from an existing well located about 5.4 miles northeast of the SPGF site. The water would be delivered to the SPGF site via a water pipeline located on the Reservation but also in a designated utility corridor administered by BLM.

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 the 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. The Toxic Substances Control Act also addresses the production, importation, use and disposal of specific chemicals (EPA 2011a). 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 2011b). Coordination with the Tribe and agencies throughout the life of the Project, including decommissioning, is critical so that applicable regulations are not violated and the public and the environment are not impacted by the Project.

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 Project decommissioning plan may incorporate the sale of some of the facility components via the used equipment market and recycling of components. Decommissioning will be conducted in accordance with a Final Decommissioning Plan that will be developed in months prior to decommissioning being initiated. This decommissioning plan assumes that all equipment and facilities within and associated with the SPGF will be removed. The transmission lines, access road and water pipeline would also be restored to as close to their original state. A compliance inspection would be performed by BLM on BLM lands.

4.1 Pre-Decommissioning Activities

Pre-decommissioning activities will be conducted to prepare the Project for demolition. These activities would include assessing the existing site conditions 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 Environmental Site Assessment will document the existing conditions of the SPGF including the location and presence of hazardous materials on the site. The results of the Environmental Site Assessment 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 site 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 on 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 temporarily remain in place for use by the decommissioning and restoration workers until these components are no longer needed. Therefore, access roads, fencing, electrical power, and raw/sanitary water facilities would be the last to be removed prior to site rehabilitation.

SPGF Above- and Below-Ground Facilities

Structures that need to be dismantled during decommissioning include the on-site substation, on-site O&M area, perimeter fence, solar field, and transformers and inverters. The on-site substation, on-site O&M area, perimeter fence, solar field, and transformers and inverters will be dismantled and moved to designated areas for either recycling or disposal at an approved landfill. 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. The evaporation ponds will be closed by first removing the wastewater and the solids / sludge from the ponds. Following removal of the materials, the high-density polyethylene (HDPE) liners, drainage layers, and leak detection system will then be removed along with any hard surface / protective layer and granular fill that may have been used as base material.

Gen-Tie Transmission Lines

If the gen-tie transmission lines will not continue to be utilized by the Tribe for another purpose at the time of Project decommissioning, the gen-tie transmission lines will be removed. Decommissioning of the gen-tie transmission lines will consist of removal of all structures associated with the construction of the transmission line(s) to include, but not limited to, overhead conductors and the removal of poles. All steel will be recycled and the foundations will be removed to a depth of at least 2 feet below the ground surface, unless BLM does not require removal of the foundations. Aluminum from overhead conductors will be recycled.

Roads

Access and 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 Project components to be removed. If the graveled access road is not needed for other future uses by the Tribe or BLM, the gravel and base material would be removed and recycled or transported to an appropriate disposal site. The same is true of any on-site roads developed in the solar field. After the road materials are removed, the roads will be restored to approximate preconstruction conditions in accordance with the Restoration and Revegetation Plan.

If the water pipeline would not be utilized by the Tribe for another purpose, the water pipeline could be removed or possibly left in place.

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 under 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 post-operational ESA described earlier. 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 Project.

4.5 Post-Demolition Site Stabilization

After all removal of existing structures of the SPGF and ancillary facilities, the Project area will be restored to topographic conditions similar to pre-construction. Then revegetation and reclamation activities required to return the disturbed areas to a pre-construction state will be conducted in accordance with the plans prepared as part of the Project.These plans include: Restoration and Revegetation Plan and Noxious Weed Management Plan. The objectives of the Restoration and Revegetation Plan and Noxious Weed Management Plan include the following: Restore topography and reduce potential for erosion, restore habitat suitable to support desert fauna, and 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 any Project ROW Grants, the Applicant will 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 Project. This estimate will consider any Project components that are expected to be left in place at the request of and for the benefit to the Tribe (gen-tie lines, access road, water pipeline). 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). 2011a. Summary of the Toxic Substances Control Act. http://www.epa.gov/lawsregs/laws/tsca.html. United States Environmental Protection Agency (EPA). 2011b. Summary of the Resource Conservation and Recovery Act. http://www.epa.gov/lawsregs/laws/rcrs.html.

Appendix E Draft Restoration and Revegetation Plan

Draft Restoration and Revegetation Plan Moapa Solar Energy Center August 2013

MSEC Restoration and Revegetation Plan

1.0 INTRODUCTION

Moapa Solar Power, LLC (Moapa Solar) proposes to construct and operate the Moapa Solar Energy Center (MSEC). The Moapa Solar Energy Center will include a variety of major components, including the Solar Power Generating Facility (SPGF), an onsite substation, gen-tie transmission lines, a water pipeline, and access road. The proposed project site is in Clark County Nevada approximately 20 miles northeast of Las Vegas, Nevada. The Moapa Solar Energy Center would be located on 850 acres of leased land on the Moapa River Indian Reservation. The associated gen-tie lines and access road would occur on Tribal lands and Federal lands managed by the Bureau of Land Management (BLM). The proposed water pipeline would be located on Tribal lands with some within a designated utility corridor administered by the BLM.

1.1 Purpose

The purpose of this Habitat Restoration and Revegetation Plan (HRRP) is to describe the proposed project, considerations related to restoration and revegetation, and the various factors and methods to be applied toward restoring the site to pre-project conditions.

1.2 Goals and Objectives

The goal of this Habitat Restoration and Revegetation Plan and its successful implementation is to mitigate the potential impacts associated with the proposed project and to facilitate managed and natural restoration of the site and impacted areas toward achieving pre-project or similar conditions. The objectives of this Habitat Restoration and Revegetation Plan 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, agency-approved plant species to revegetate disturbed areas; 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.

1.3 Project Description

1.3.1 Project Area

The proposed project would be located approximately 20 miles northeast of Las Vegas in Clark County, Nevada. The main project site, including the Solar Power Generating Facility, would be located on 850 leased acres within the Reservation in Mount Diablo Meridian, Township 16 South, Range 64 East, Sections 29, 30, 31, and 32. Portions of the gen-tie lines and access road would be located on lands administered by the Tribe and BLM. A water pipeline associated with the Project would be located on Reservation lands north and east of the Solar Power Generating Facility. Figure 2 shows the location of the Proposed Project and associated facilities.

MSEC Restoration and Revegetation Plan

The proposed project would occur in the Basin and Range physiographic province in a part of the Mojave Desert. The Basin and Range physiographic province is characterized by the hundreds of long, narrow, and nearly parallel mountain ranges that are separated by deep valleys (Mac et al 1998).These features of the province are visible at the proposed Moapa Solar Energy Center (MSEC) project site, with nearly parallel mountain ranges to the east and to the west of the proposed Moapa Solar Energy Center project site and a broad and gently sloping valley between. The proposed Moapa Solar Energy Center project site occurs in the Mojave Desert Scrub biome and is dominated by plants common to the Mojave Desert Scrub biome including creosote bush (Larrea tridentata), and white bursage (Ambrosia dumosa).

1.3.2 Project Components

The major components of the proposed Moapa Solar Energy Center (MSEC) project include a solar power generation facility (SPGF) that would use photovoltaic (PV) to generate up to 200 Megawatts (MWs) of energy. The proposed Moapa Solar Energy Center project would require an onsite substation with medium to high voltage step-up transformers. New transmission lines would be constructed to connect to the existing transmission utility in order to deliver the generated power. The proposed Moapa Solar Energy Center project would connect to the electrical grid via one or two gen-tie lines, depending on the needs of the customer(s) purchasing the electricity. A single circuit, 230 kilovolt (kV) overhead transmission line would be constructed from the solar power generation facility to the Harry Allen Substation, an estimated distance of 7.1 miles. A 500-kV overhead transmission line would be constructed from the solar power generation facility to the Crystal Valley Substation, an estimated distance of 1.6 miles. Vehicle and construction equipment would gain access to the proposed Moapa Solar Energy Center project site by using a proposed 2.5-mile gravel road that would connect the proposed Moapa Solar Energy Center project to an existing paved frontage road near Interstate 15. This proposed gravel road would follow an existing unimproved route for an estimated 2.0 miles where the proposed gravel road meets the proposed 230-kV right-of-way (ROW). From this point, the proposed access road would lead 0.5 miles to the north to connect with the solar power generation facility site.

2.0 SOILS

Typical of soils in arid environments, local soils are poorly developed and shallow; local soils are almost completely absent in some areas. In general, the local soils are typically only four inches deep and are rarely more than 18 inches in depth over an underlying caliche layer. The 850-acre Moapa Solar Energy Center site contains two soil series - the Grapevine series which covers approximately 95 percent and the Ireteba series that makes up the remaining 5 percent. Soils where the proposed transmission line corridors and access road to support the Moapa Solar Energy Center project are located include the Anthony, Bard, Mormon Mesa, St. Thomas, and Tonopah series.

3.0 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). These plants are 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. The most commonly found species is the creosote bush (Larrea tridentata). Approximately 70 percent of the Mojave Desert is covered by creosotebush-white bursage (Ambrosia dumosa) associations. Species associated with creosotebush-white bursage communities in the Mojave Desert include Shockley's goldenhead (Acamptopappus shockleyi), Anderson's wolfberry (Lycium andersonii), range rhatany (Krameria parvifolia), Mojave yucca (Yucca schidigera), California joint fir (Ephedra funerea), spiny hopsage (Grayia spinosa), and winterfat (Krascheninnikovia lanata). Other associated species are desert senna (Cassia armata), Nevada ephedra (Ephedra nevadensis), white burrobrush (Hymenoclea salsola), and wolfberry (USDAFS 2010). Grasses regularly found are big galleta (Hilaria rigida), Indian rice grass (Oryzopsis hymenoides), bush muhly (Muhlenbergia porteri), fluff grass (Erioneuron pulchellum), red brome (Bromus rubens), desert needle (Stipa speciosa), Arabian grass (Schismus arabicus), snakeweed (Gutierrezia sp.), desert trumpet (Eriogonum inflatum), winged saltbush (Atriplex canescens), and desert grass (Blepharidachne kingii). The proposed Moapa Solar Energy Center project is situated within the Mojave desertscrub biome and is dominated by the creosotebush series. The area is dominated by open stands of creosotebush and white bursage, and cactus-yucca scrub is also present and concentrated within the ephemeral washes.Desert saltbush scrub habitat (saltbush series) is present though not widespread. Cactus species observed during the biological surveys include the barrel cactus (Ferocactus acanthodes), beavertail cactus (Opuntia basilaris), cottontop cactus (Echinocactus polycephalus), hedgehog cactus (Echinocereus engelmanii var. chrysocentrus), pencil cholla (Opuntia ramosissima), silver cholla (Opuntia echinocarpa), grizzlybear prickly pear (Opuntia polyacantha var erinacea), and teddybear cholla (Opuntia bigelovii). Vegetation within the Project Area is composed primarily of Mojave Desert creosote bush scrub as defined by Holland (1986) classification of plant communities. Disturbed areas, both within and adjacent to the Project Area, are associated with multiple dirt roads and less impacted off road vehicle trails, the adjacent railroad and interstate highway (to the east) and the adjacent transmission line and natural gas line corridors (to the north and west).

The Creosotebush Series Creosotebush-White Bursage community is dominated by creosotebush shrubs (Larrea tridentata) and white bursage (Ambrosia dumosa), 0.5-3m tall, widely spaced, usually with bare ground between. Many species of ephemeral herbs may flower in late March and April if the winter rains are sufficient. These plants are usually found on well-drained secondary soils with very low water-holding capacity on slopes, fans, and valleys. Other, less numerous species of annuals appear following summer thundershowers. This creosotebush scrub is typical of the Mojave Desert. Nearly the entire SPGF and most of the gen-tie transmission routes, access road, and water pipeline are covered by this vegetation community.

White bursage is a pioneer species and provides a stable environment for the creosote bush to establish a foothold. The typical growth height for creosote bush is four feet, although some creosote bushes may reach up to 12 feet with an adequate water supply. Many desert animals use creosote bush for shelter. Burrows are dug around and under creosote bushes by both reptiles and amphibians. Roots of creosote bush stabilize the soil and support burrows of the desert tortoise. Large kit fox den complexes are often found in association with creosote habitat for the same reason (NDOW 2012). Most animals bed in or under the bushes as well as use creosote bushes for perching or nesting. Creosote bush enables animals to escape the harsh sun and extreme temperatures as well as provides cover and escape from predators. Creosote bush is browsed, or consumed, by many small mammals. The foliage, twigs, and seeds of creosote bush are readily consumed as a food source.

White bursage commonly grows on arroyos, bajadas, gentle slopes, valley floors, and sand dunes at elevations up to 3,000 feet throughout the Sonoran and Mojave Deserts (USDAFS 2010). White bursage is a desert shrub growing up to two feet tall and spanning three feet in width. White bursage is of intermediate forage value (USDAFS 2010). White bursage plants, seedlings, and seeds are a food source for black-tailed jackrabbits (Lepus californicus). Desert rodents, such as the kangaroo rat (Dipodomys sp.), also consume the seeds of white bursage.

Cactus/Yucca habitats are also present and concentrated near the south end of the 230-kV gen-tie option. Cactus species observed during the biological surveys were the barrel cactus (Ferocactus acanthodes), beavertail cactus (Opuntia basilaris), cottontop cactus (Echinocactus polycephalus), hedgehog cactus (Echinocereus engelmannii var. chrysocentrus), pencil cholla (Opuntia ramosissima), silver cholla (Opuntia echinocarpa), grizzlybear prickly pear (Opuntia polyacantha var. erinacea), and teddybear cholla (Opuntia bigelovii). Most cacti were concentrated in ephemeral washes as well as on a sloping bajada near the Harry Allen Substation.

Xeroriparian habitats were associated with the several small washes that cross the various portions of the project area. These xeroriparian habitats generally resembled the Creosotebush-white bursage habitats but had a higher overall density of vegetation as well as a greater abundance of big galleta grass.Other species included cholla, cheesebush (Hymenoclea salsola) and ephedra (Ephedra sp.). Saltbush: Approximately 10.4 acres of saltbush occurs within the right-of-way of the 230-kV gen-tie option and is found at the margins of the playa lake. These areas include small but monotypic stands of saltbush (Atriplex sp.) and form the transition between the surrounding upland habitats and the playa lake. Fourwing saltbush (Atriplex canescens) is a common occupant in early successional habitats. However, fourwing saltbush is also found late in successions dominated by sagebrush. Saltbush growth can reach up to 15 feet high, depending on the amount of water available, though saltbushes commonly grow two to three feet high. Saltbush provides food and shelter for desert wildlife. Fourwing saltbush is a valuable forage shrub because fourwing saltbush is abundant, palatable, provides large quantities of forage, is nutritious, and grows rapidly. Leaves, stems, and fruits of fourwing saltbush provide browse throughout the year.

The 230-kV gen-tie transmission option crosses a large playa lake. This habitat type consists of unvegetated habitats with highly compacted soils. The playa lake is likely subject to ephemeral flooding following large precipitation events. Playas are formed by intermittent flooding and evaporation that precipitates fine soils and mineral salts onto the lowest flat depressions until an impermeable layer of sodic clay is lain down. Dry playas are often barren of vegetation from their center out to their outer margins, where saltgrass, pickleweed, or stunted greasewood maintain a foothold on the fresher soils. When soils are kept moist but short of saturation over several weeks or months, Baltic rush, smartweed, sedges, and spikerushes emerge, in progressive order of wetness. Most playas in Nevada do not have permanent sources of water; therefore, the value of playas to wildlife is largely ephemeral in nature. When playas are watered for the proper period of time, the playas can produce not only lush growth of emergent and submergent vegetation but also prodigious volumes of aquatic invertebrates attracting a myriad of waterfowl, shorebirds, and small water birds (NDOW 2012).

Several small mesquite bosques are located within the perimeter of the playa lake. These areas represent monotypic stands of mesquite (Prosopis sp.) with no understory species. Disturbed habitats include all areas with little or no native vegetation as a result of anthropogenic disturbance. These areas include existing roads, transmission line pole sites, pipeline right-of-ways, and other areas that have been significantly altered.

In the State of Nevada, cacti and yucca are afforded protection. According to the Nevada Revised Statute (NRS 527.100): "It is unlawful... to remove or possess any Christmas tree, cactus, yucca or branches thereof, or knowingly transport or sell any Christmas tree, cactus, yucca or its branches from any of the lands owned by or under the jurisdiction of the State of Nevada or its counties, or any reserved or unreserved lands owned by the United States, or from any privately owned lands, without permission from the legal owner, or the legal owner's duly authorized agent, specifying locality by legal land description and number of plants to be removed or possessed." As previously described, aspects of the proposed project occur on Tribal lands [Moapa Band of Paiute Indians (Tribe)] and the Bureau of Land Management (BLM). In instances of cacti and yucca relocation and salvaging, both the Tribe and BLM will be consulted for guidance.

Cacti or yucca that occur in areas that are proposed for permanent disturbance will be subject to salvage operations and either transplanted at an approved offsite location or in areas onsite that are not proposed for disturbance and suitable to supporting these plants. The Tribe will be consulted prior to transplanting cacti or yucca to offsite Tribal lands. The BLM manages cacti and yucca as special forest products with a commercial value. Cacti and yucca that occur in areas proposed for temporary disturbance will be appropriately removed and maintained onsite until temporary disturbance has concluded and appropriate restoration efforts have occurred to support replanting these plants in their original habitats. All cacti and yucca planting activities shall be conducted by a qualified salvage contractor. BLM requires contractors to have at least three years’ experience in Mojave desert salvaging, including maintaining cacti and yucca. On BLM lands, the contractor will also be required to use the BLM salvage protocol (included as Appendix A).4.0 RESTORATION ACTIONS Pre-construction Tasks Pre-construction tasks include 1) perennial plant salvage and seed collection (if required by the BLM), 2) succulent plant salvage (if required by BLM), 3) vegetation propagation (if required by BLM), 4) vertical mulch salvage, and 5) topsoil salvage. The collection of locally-occurring seeds is an effective means of increasing the success of revegetation efforts because the seeds represent local genetic variations, adaptations, and vigor of the plant species. However, seed collection can be labor- and time-intensive, costly, and often seed collection efforts fail to yield the type and quantity of seed required for full revegetative success. The application and effectiveness of performing onsite seed collection prior to the start of surface disturbing activities will be evaluated with the Tribe and BLM. In some cases, active local seed collection is not necessary, as the removed and stockpiled topsoil contains a seed bank that can provide natural opportunities for reseeding. In situations where the local seed bank is insufficient or enough topsoil is not available to resurface and reclaim disturbed sites, commercially available certified weed-free seed would be obtained and used for reseeding. The seed mix would be approved by the BLM. Vertical mulch would be salvaged adjacent to the disturbed areas with the topsoil (e.g., vegetation and topsoil will be windrowed on the outer edges of disturbed areas). Post-Construction Tasks Restoration and revegetation efforts at disturbed sites will begin within weeks of completing the soil disturbing activities. For sites that may be disturbed again during the construction phase, temporary soil covering, erosion control, and weed monitoring would occur until more permanent revegetation efforts can be applied. Disturbed sites will be reclaimed prior to initiating specific revegetation efforts. In accordance with Nevada Guidelines for Revegetation and BLM requirements, salvaged topsoil would be replaced. Disturbed sites would be recontoured to pre-disturbance elevations, soils would be decompacted, and stockpiled topsoil and vertical mulch will be replaced. The soil surface would then be textured, succulents would be replanted, and the area would be reseeded with a BLM-approved seed mix. In instances when salvaged topsoil and its associated seed bank are not in sufficient supply or type, seed mixes approved by the BLM and Tribe will be used. Seed mixes shall be certified weed free, obtained from local suppliers, and should preferentially be of native varieties that originate from within 1,000 feet elevation of the project site. In cases where native seed are not available, the BLM and Tribe shall approve the use of non-native, non-invasive, naturalized species. Finally, signs identifying restoration areas will be installed at all vehicle entry points. |Page 8 207 MSEC Restoration and Revegetation Plan The use of stockpiled topsoil may not be appropriate or possible in all areas proposed for disturbance. In areas that stockpiled topsoil is not used during restoration and revegetation, the following practices will be implemented: cent Disturbed soil will be scarified, harrowed, or disked, in order to prepare a seed bed; cent Native and/or naturalized seeds will be broadcast; cent Sowed seeds will be protected with a layer of weed-free mulch or straw; cent Seed contact with soil will be improved by disking or rolling; and cent Reseeded areas will be appropriately watered. All restoration and revegetation efforts should be implemented soon after disturbance of a site has concluded and prior to the typical rainy season of late summer and early fall. This timing will minimize the potential for soil loss and establishment of noxious weeds, as well as maximize revegetation efforts. Reseeded reclaimed areas shall be watered during periods of below-average precipitation, in order to promote seed propagation. Per BLM requirements, the salvage contractor must maintain cacti and yucca for at least one year and attain an 80 percent success rate. BLM also requires project proponents to seed any disturbance where earth moving occurs. Reseeding is also required if the project does not meet project performance criteria (Section 8). 6.0 PHASES OF RESTORATION AND REVEGETATION Restoration and revegetation activities will occur primarily in two phases: 1) post-construction and 2) post-decommission. 6.1 Post-Construction Post-construction restoration and revegetation activities focus on areas that will not experience additional surface disturbing activities (e.g., service roads required during construction, equipment and material laydown areas, etc.). Seeds of native herbaceous plants will 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 (Section 8). 6.2 Post-Decommission Post-decommission restoration and revegetation efforts will focus on all areas within the SPGF facility. Other features that occur beyond the SPGF on BLM administered lands, including roads and transmission lines, will not be restored or revegetated. Post-decommission restoration and revegetation will be based on similar regulations, guidelines, practices, and techniques as previously described in this report. The goal of post-decommission restoration and revegetation is to restore the project site to conditions similar to pre-construction conditions (Section 8). 7.0 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 (to be approved by the BLM and Tribe). BLM guidelines and regulations for weed management will be applied for the entire MSEC Restoration and Revegetation Plan project, regardless of land ownership, because the Tribe has not issued weed management guidance. 8.0 MONITORING The goal of restoration and revegetation both after construction and after decommissioning is to achieve plant densities and species compositions that reflect the native, non-invasive vegetative communities occurring in adjacent or nearby habitats. A qualified biologist that is familiar with Nevada flora and restoration practices will conduct the monitoring. Both qualitative and quantitative monitoring will be conducted per the schedule described in Table 1. Both quantitative and qualitative monitoring data will be used to evaluate recovery, identify the need for additional remediation, inform a final decision to release the proponent from further responsibility, and return any bonds held by BLM. Monitoring of pre-construction restoration actions, such as plant salvage and seed collection, will be performed under the supervision of a qualified biologist or restoration ecologist. Table 1 - Restoration Monitoring Schedule Task Year 1 Year 2 Years 3-5 Year 6 Qualitative Monitoring Site Monthly Quarterly Biannually Annually inspections/visual assessments Photo monitoring Biannually Annually Annually Annually Quantitative monitoring Transect/plot Annually Annually Annually Annually monitoring Qualitative Monitoring Qualitative monitoring will be used to inform the proponent, contractors, and BLM regarding the trajectory of recovery and identify potential problems at an early stage so that corrective actions can be taken before the overall project timeline is adversely affected. Qualitative monitoring will include documentation via photo points, site inspections, and visual assessments made by the Project Biologist or Restoration Ecologist. A site-specific qualitative monitoring form should be developed and used to provide consistency throughout the monitoring period. The goal of qualitative monitoring is to document site conditions and evaluate the need for remediation to ensure that sites are progressing toward the success standard. Qualitative monitoring should include: observations regarding the germination and establishment of species included in the seed mix; estimates of the success parameters (cover, density, and richness of perennial vegetation); and estimates of the density and richness of native annuals. Other site characteristics that should be observed and noted include: soil erosion, natural recruitment of native plant species, reproduction, nonnative plant species abundance, animal use, and patterns of establishing vegetation (i.e., presence of large interspaces). MSEC Restoration and Revegetation Plan Quantitative Monitoring Quantitative monitoring will be used to objectively evaluate whether the project has achieved sufficient progress so that the project can be considered restored to a point where natural processes will complete recovery, and the proponent can be released from further responsibility. As part of quantitative monitoring, success parameters are measured on restored sites in the sixth growing season (or sooner if deemed appropriate) and compared to undisturbed reference areas to determine if the restoration standards have been met. Sample locations within both the reference area and reclaimed area need to be randomly selected. Sample size adequacy should be calculated to ensure a sufficient number of samples are taken to estimate the means for success parameters with a given level of confidence. If the mean for a given success parameter is less than the standard (i.e., 70% of the reference area mean) a statistical comparison is made with a one-sample, one-sided t-test (with a=0.10 and a=0.20). Failure to reject the null hypothesis that the reclaimed area value is greater than or equal to 70% of the reference area value for each parameter (cover and density) indicates that the site has been successfully reclaimed. Species richness is evaluated by comparing the total number of native perennial plant species encountered in the measured area of the reclaimed site to that of the reference area. Species richness of the reference area is based on the same amount of area that was sampled within the restored site.Certainly! Here’s the revised text with coreference resolution applied to replace pronouns with corresponding noun phrases:

Because species richness is based on the entire measured area of a site, there is no measure of variation, and therefore no statistical test can be performed. Therefore, a comparison of the absolute numbers of species to the reference area must be made. Quantitative Performance Standards Restoration will be considered successful if plant cover, plant density, and species richness of the dominant native perennial vegetation are equal to or exceed a designated percentage of the values for plant cover, plant density, and species richness in undisturbed reference areas. The standards required for the four BLM land management designations are: 100 percent for R1, 70% for R2, and 60% for R3 and R4 (see Appendix A). The annual performance targets in Table 2 are recommended to evaluate annual progress towards achieving the final standard. If progress substantially differs from these performance targets, remedial measures could be necessary to bring the project back on schedule. |Page 11

210 MSEC Restoration and Revegetation Plan Table 2 - Six Year Performance Targets

Year Transplant/Container Native Density Richness Noxious Survival Perennial of Native of Native Weed Species Perennial Perennial Cover Cover Species Species Recommended 1 N/A 10% >100% 60% <2% Performance

2 N/A 20% 80% 60% <2% Targets

3 N/A 30% 60% 60% <2%

4 N/A 40% 60% 60% <2%

5 N/A 50% 60% 60% <2%

Final 6 N/A 60% 60% 60% <2% Performance Standard1

1 Depending on conditions that affect seedling germination establishment and growth, achieving the final performance standard for cover may be less important, if plant density, species richness and other factors indicate an overall positive upward trend for the project. |Page 12

211 MSEC Restoration and Revegetation Plan 9.0 MAINTENANCE AND REPORTING

Regular maintenance and reporting are essential for project success. Regular maintenance includes weeding and maintaining fencing, if fencing is constructed. Maintenance and reporting will be performed as described in Table 3. Table 3 - Six Year Restoration Maintenance and Reporting Schedule

Task

Year 1 Year 2 Year 3-5 Year 5

Maintenance Weeding As needed As needed Annually Annually Fencing Monthly Quarterly Annually Annually

Inspections/Repair Trash Removal As needed Quarterly Annually Annually

Reporting Upon Completion As-built of Construction Email Progress Quarterly Quarterly Biannually N/A Reports Annual Report Yes Yes Yes Yes

As-Built Report Within 30 days of the completion of project construction, the As-Built report will be submitted to BLM for approval. Once approved, the six-year monitoring, maintenance, and reporting period will begin. The purpose of the As-Built report is to document implementation of the pre-construction and post-construction restoration tasks described in Table 3 and describe any changes made during implementation. At a minimum, the As-Built report will include:

cent Discussion of how the project was implemented, key personnel responsible for the project, any problems encountered and how problems were resolved.

cent A chronology of the implementation with dates and names of contractors and key personnel responsible for implementing restoration tasks.

cent Photo documentation of all milestone restoration tasks (i.e., earthwork, seeding, signage)

cent Copies of field notes or log entries from biological monitors present.

cent A map of the restoration site indicating treatment locations, the location of photo points, quantitative reference sites and monitoring sites.

cent Scans of the seed tags or any germination viability testing performed on wild collected seed used for seeding.

cent Copies of dated invoices from contractors and subcontractors that provided services for the project.

cent Baseline data collected for quantitative monitoring.

Progress Reports Progress reports will be provided to BLM using the schedule described in Table 3. The purpose of the progress reports is to document regular site monitoring by the proponent or designated contractor. Progress reports are not expected to be extensive and are anticipated to be delivered in an email or similar format. At a minimum, the progress reports will include:

cent The dates and name(s) of the biological monitor(s) completing the site assessments.

cent A brief discussion of site conditions.

cent A discussion of problems encountered with recommendations for corrective actions, if necessary.

cent The dates and a brief description of all maintenance activities completed during the monitoring period.

Annual Reports Annual reports will be provided to BLM using the schedule described in Table 3. The annual report will be provided to BLM by December 31 of each calendar year.The purpose of the annual report is to summarize maintenance and monitoring activities for the year, document wildlife activity of the site, report the results of the annual qualitative and quantitative monitoring activities, compare current seasons findings with the base line and previous years to evaluate project progress towards meeting annual performance targets and the final performance standards, identify potential problems, and, if necessary, recommend corrective actions.

If the recommended annual performance goals are not achieved, corrective actions will be necessary. Making corrective actions early in the project during the first or second growing season is particularly important to keeping the project on schedule for completion in the six-year timeframe. Corrective actions could include, but are not limited to, reseeding, weed treatments, installing and maintaining container plantings, and installing protective fencing or wire cages to protect individual plants.

The restoration will be considered successful when the final performance standards have been met. Bonds held by BLM for the restoration/revegetation/reclamation phase will not be eligible for release until the final performance standards are achieved. If the minimum levels are not achieved, then corrective actions or additional growing seasons will be necessary. If the project has not achieved the performance standards within the six-year timeline, the proponent remains responsible for continuing project maintenance, monitoring and reporting until the standards are achieved or until BLM determines sufficient progress has been made and releases the project.

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The salvaging contractor shall identify on site with flagging tape all cacti and yucca that are subject for removal and will mark the north orientation for any barrel or Joshua tree. The following plants will be salvaged: 1) all yucca, 2) barrel cactus, 3) hedgehog, 4) cottontops, 5) all beavertail cactus and other cactus species; and 6) all cholla LESS THAN THREE FEET IN HEIGHT. Cholla over three feet in height and Joshua trees over 10 feet in height do not need to be salvaged. This material will be used as vertical mulch and spread over the surface of the restored areas to prevent possible trespass. During the survey, all yucca clusters shall be counted as separate plants. Since the material will not be used immediately, the material needs to be stockpiled in a location that can be protected (fenced). Cacti and yucca are very shallow-rooted. Cacti should be dug by hand and carefully removed in order to not damage roots. Yucca must be salvaged with heavy equipment (eg, front end loader). The material must be carefully extracted to not damage any of the roots, stems, or lower parts of the plant.The material must be transplanted to a stockpiling area immediately. Stockpiling: The salvage can be transferred to prepared 3-foot wide, 18-inches deep stockpiling trenches of any desired length. If using multiple, parallel trenches, the multiple, parallel trenches should be far enough apart to allow heavy equipment access to each trench. Trenches shall be watered thoroughly prior to transplanting material. In planting cacti and yucca, the cacti and yucca should be placed in the trench and planted with native soil. Care should be taken to properly tamp down and compact all soil around roots of plants to remove all air pockets. A depression around each plant should be formed to hold water. After cacti are transplanted, the cacti shall be watered thoroughly one time. A one time watering approximately fifteen (15) days after planting shall occur to remove or minimize any air pockets and assure proper soil compaction. Yucca will be placed in the trenches and the soil tamped by hand around the base of the plant so that there are no air pockets. To reduce watering, DriWater can be applied to each yucca. DriWater is a gelatinous polymer that slowly breaks down to water over time. DriWater comes in biodegradable cartons and is applied by cutting the top of the carton and placing the top of the carton upside-down around the plant to be watered. The area around the plant must be thoroughly wet to activate the DriWater. The DriWater is applied around the base of the plant at a rate of one quart for every foot in plant height. DriWater cartons are to be buried completely. At the surface, a watering well will be formed around the plant. Afterward, the plant will be watered thoroughly again. A 9-inch soil moisture probe (which can be obtained from any commercial plant nursery) will be used after 2 weeks to assess the moisture of the soil to see if further watering is needed. If the probe reads "dry" on the moisture scale, then a second watering will be done. Final Planting at Landscape Sites: All salvaged plant material shall be replanted in a natural pattern. Large yucca will be carefully removed from the stockpiling area, taking care not to damage stems, roots, or the base of the plant. A hole at least two feet deep and three feet wide shall be prepared for each single stem yucca. Multiple stem plantings will be accordingly larger to accommodate the stem size. The hole will be filled with water and allowed to drain once. Then the hole will be filled with water again and then back- filled with soil to form a muddy matrix to about 18 inches from the surface. The yucca will then be planted and the soil tamped around the plant so that there are no air pockets. DriWater will be applied around the plant at a rate of one quart for every foot in height. DriWater cartons are to be buried completely. At the surface, a watering well will be formed around the plant. Afterward, the plant will be watered thoroughly again. A 9-inch soil moisture probe (which can be obtained from any commercial plant nursery) will be used after 2 weeks to assess the moisture of the soil to see if further watering is needed. If the probe reads "dry" on the moisture scale, then a second watering will be done. Mojave yuccas will be re-planted in groups of three or more for a natural effect. All small cacti shall be watered thoroughly one time upon being transplanted into the field. Transplanting and maintenance of plant material will be done such that 80 percent survivorship after two years is achieved.

Appendix F Hydrogeological Assessment

Mifflin & Associates, Inc. HYDROGEOLOGIC ASSESSMENT and GROUNDWATER MODELING ANALYSES for the MOAPA SOLAR ENERGY CENTER A RES Americas Project In Cooperation with the Moapa Band of Paiutes Moapa Indian Reservation Clark County, Nevada Prepared by Mifflin and Associates, Inc. Martin Mifflin Cady Johnson June 11, 2013

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Location of Moapa Indian Reservation and Project area...................................................5 2.\*\*Introduction\*\* Moapa Solar, LLC (RES Americas) and the Moapa Band of Paiutes (MBOP) are developing a 200 MW solar energy project on the Moapa Indian Reservation and lands administered by the Bureau of Land Management (BLM) in Clark County, Nevada. The projected water consumption of the solar energy project is estimated to be between 350 and 800 acre-feet per year (afy). The proposed source of water supply for the 200 MW solar energy project is the Carbonate-Rock Aquifer, which underlies the western extents of the Moapa Indian Reservation. The proposed site for photovoltaic and concentrated solar arrays is in the southwestern portion of the Moapa Indian Reservation, in Sections 29, 30, 31, and 32 of T16S, R64E (Fig. 1). The supply well (ECP-1) is located approximately 4 miles northeast of the boundary of the 200 MW solar energy project in the Belly Tank Flat area. The purpose of this study is to evaluate the direct and indirect impacts of the 200 MW solar energy project's pumping stresses in the carbonate aquifer on the hydrologic systems of the region. As the depths to regional saturation in the carbonate aquifer are generally quite deep (100 to 200 meters) and transmissivities are high (over 2,500 m²/day) in the area where the production well has been completed and tested, the lowering of water levels due to pumping cones has not been recognized as a concern. A few feet, or even several tens of feet of water-level decline are not primary concerns because the pumping lifts are relatively large, the aquifers are thick (over 1,000 m), and existing production wells are deeply penetrating (generally over 100 m). However, many of the carbonate aquifers throughout the general region are believed to be associated with groundwater flow systems that discharge at large springs. Therefore, a continuing concern as the carbonate aquifers are developed for water supplies is the potential for long-term impacts on spring flows. A formal decision framework for evaluating these concerns is made possible by numerical groundwater models, which embody known and assumed physical properties of the hydrologic system and mathematical rigor to forecast impacts in time and space that would result from hypothetical pumping stresses. To be most useful, groundwater modeling analyses should address conceptual uncertainty through bounding analyses. The bedrock of the project area is largely composed of Paleozoic carbonate rocks, ancient marine sediments that contain the minerals calcite and dolomite as their primary constituents.Fracture zones and associated solution cavities within carbonate rocks provide highly transmissive aquifers where the carbonate rocks are saturated, and such transmissive zones can be continuous over areas larger than the topographic basins and ranges evident at land surface. "Regional" groundwater flow is the result of large-scale interconnections, and is readily demonstrated by uniformity of temperature and discharge at associated springs, and by chemical characteristics (Mifflin, 1968). Discharge from regional groundwater flow systems can be several basins removed from contributing areas of recharge, as is the case for the Muddy River springs and Rogers/Blue Point springs areas (Fig. 1). Recharge is known to be most effective in high, mountainous terrain where precipitation is greatest and winter snow packs are common. The fact that large springs with uniform flow characteristics are present in the low (<1000 m) and arid (11-12 cm/yr) Project area while winter snow packs are rare in adjacent ranges argues strongly for regional (interbasin) groundwater flow.

A primary question is the impact of the Project on future flows from the Muddy River springs, an area of regional groundwater discharge about 12 miles north of well ECP-1. Outflow channels from the Muddy River springs constitute the headwaters of the Muddy River and establish the habitats of the endangered Moapa Dace, an endemic fish. The analytical strategy that satisfies the impact of the Project on future flows consists of stepwise application of a) a steady-state, regional model based on the Analytic Element Method (AEM) from which boundary conditions for b) a transient, sub-regional model based on the Finite Difference Method (FDM) are extracted. Secondary questions related to water-level changes and dynamics of flow within the aquifers of the region are conveniently addressed with stepwise application of a steady-state, regional model and a transient, sub-regional model.

There are three distinctive lithologies that determine the regional patterns of groundwater flow: Paleozoic carbonate rock, indurated Mesozoic sediments, and Cenozoic basin fill. The Paleozoic terrain can be highly transmissive, particularly where the Paleozoic terrain is affected by extensional faulting and subsequent dissolution. Mesozoic terrain is locally important as a hydraulic barrier, particularly where large folds involving fine-grained sediments are present beneath Mesozoic thrust faults. Cenozoic basin fill is very heterogeneous, but volumetrically the fine-grained sediments (aquitards) are far more significant than local accumulations of sand and gravel at basin margins.

The Paleozoic carbonate rock sequences are about 2 km thick in the Project area (Longwell et al., 1965), and Mesozoic red beds of siltstone and sandstone are locally thicker but erosion has removed Mesozoic red beds of siltstone and sandstone from much of the region. Mesozoic rocks are preserved primarily in the footwalls of Mesozoic thrust faults, and in that setting, Mesozoic rocks are strongly folded and thickened. Thickness of Cenozoic basin fill is highly variable and known only from geophysics and sparse drill holes, but the thickness of Cenozoic basin fill can reach thousands of feet. Since early Miocene time, extensional faulting has been blocking out the present basins and adjacent mountainous terrain as the basins filled with sediments rich in volcanic ash and therefore low in permeability.

The subsurface geometry of the extensional faults and the magnitude of Cenozoic extension are intertwined issues and subjects of great controversy in the scientific literature. The area of study incorporates the general framework incorporating extensional faulting, with lacustrine sediments of the Muddy Creek Formation the most widely exposed basin-fill unit. The Muddy Creek Formation also contains paludal (spring and marsh) deposits, but lithologically the Muddy Creek Formation is fine-grained except at basin margins, and hydrologically the Muddy Creek Formation can be considered an aquitard. Evaporites (salts) occur within the Muddy Creek Formation, making the Muddy Creek Formation a poor target for groundwater development from both quality and quantity standpoints. Mesozoic rocks are rich in evaporites and of low permeability, so Mesozoic rocks are similarly unattractive as exploration targets.Locally, alluvial aquifers inset into the Muddy Creek Formation occur in the basin along the Muddy River and lower Meadow Valley Wash. The alluvial gravels in upper Moapa Valley extend from about 3 km northwest of the Muddy River springs area to the Glendale area, where the alluvial gravels are joined by similar alluvial gravels associated with lower Meadow Valley Wash. The alluvial gravels attain thicknesses of about 35 m beneath the narrow floodplains of these two drainages. Local heavy pumping from these transmissive gravels has degraded water quality as poorer-quality water has been drawn in from the subjacent Muddy Creek Formation. Complicating the hydrology in the Muddy River springs area is the relationship between the carbonate aquifer and the alluvial gravels. The Muddy Creek Formation generally separates the carbonate aquifer and the alluvial gravels, but locally the Muddy Creek Formation is missing or conduits provide a direct connection from the carbonate aquifer to the alluvial gravels. The gravel aquifer is recharged by the carbonate aquifer 3 km up-gradient from the Muddy River springs, where the alluvial aquifer discharges as base flow in the headwater channels of the Muddy River. In this same general area several large springs issue directly from the carbonate aquifer with outflow channels to the Muddy River. Roughly one half of the flow in the Muddy River was spring discharge in the early 1960s, and the other half of the flow was base flow derived from the alluvial aquifer (Eakin and Moore, 1964). Highly cemented, active and extinct spring conduits pass through the alluvial aquifer without contributing much leakage to the alluvial aquifer gravels. Within about 1.5 km below the spring zone, the Muddy River channel becomes hydraulically isolated from the underlying alluvial aquifer gravel by a Holocene clay, and the Muddy River channel remains separated at least to the Reservation boundary where well control ends. The Warm Springs Road gaging station is downstream of the area where the alluvial aquifer becomes confined, thus gaging records are very useful to measure net upstream groundwater and surface-water diversions from the carbonate aquifer, the alluvial aquifer, springs, and Muddy River. The entire flow of the Muddy River is derived from the discharge from the regional carbonate aquifer, except during infrequent precipitation events that increase Muddy River flows for up to a few days. Historic flow records indicate that about 51 cubic feet per second (cfs) of groundwater discharge sustain the spring and river flows. Currently, consumptive uses related to 1) natural evapotranspiration, 2) surface-water diversions, and 3) groundwater diversions reduce the Muddy River flows to about 25,000 afy (35 cfs) at the Warm Springs Road gaging station, located about 3 km downstream of the spring area. Thus, about 32% (12,000 afy) of the regional flux to the area is consumptively removed from the system above the gage. Of this, about 3600 afy (~25%) is estimated to be lost by evapotranspiration from the well-vegetated areas of the headwater channels and springs, and the rest is removed through pipelines by Moapa Valley Water District (MVWD) and Nevada Power Company (now Nevada Energy) for use elsewhere. During the drought that began in 1997 and continued until the fall of 2004, Muddy River flows appear to have decreased by about 4 cfs (3000 afy) in association with a gradual decline in water levels in the carbonate aquifer throughout the region. The wet spring of 2005 has caused at least a partial recovery of these drought-induced decreases. The Paleozoic limestones and dolomites of the Project area extend over a very large area to the north, south, and west of the Project area to establish a sub-region that has been named the Arrow Canyon Range Cell (ACRC) of the carbonate aquifer (Mifflin, 1992; Johnson and Mifflin, 2003). The Carbonate Rock Province (Mifflin 1968, 1988) extends from southeastern California through much of eastern Nevada and western Utah, where bedrock geology is dominated by Paleozoic carbonates and evidence for interbasin groundwater flow is commonly recognized. Within the ACRC, which underlies the western half of the Moapa Indian Reservation, hydraulic gradients are so small that directions of groundwater movement are uncertain. Questions of groundwater fluxes and flow directions have been addressed using groundwater models. Since 2000, comprehensive water-level monitoring on the Moapa Indian Reservation and a 7-day aquifer test have provided the parameter estimates and boundary information required by modeling studies.Several new monitoring wells were drilled in Coyote Spring Valley in 2003 by the Southern Nevada Water Authority (SNWA), providing constraints on the broader hydrologic regime via water levels and hydrochemical information. Isotopic data from these SNWA wells have proven to be particularly useful. The EIS analyses for the Calpine Project (Johnson et al., 2001) began a series of in-depth modeling investigations that evolved as the monitoring records accumulated, culminating in recognition of an important hydraulic barrier (Johnson and Mifflin, 2003) and publication of the modeling approach (Johnson and Mifflin, 2006).

The carbonate aquifer of the Ash Creek Research Center (ACRC) is very unusual, with good hydraulic continuity over a vertical thickness of 5000 feet based on water temperatures and measurements while drilling. Regional transmissivities are therefore high, and fluxes can be large in spite of the low hydraulic gradients. Given that upwelling zones are almost certainly present near the Calpine Project area, based on pumping response and the presence of fossil spring deposits (described below), documenting the effects of Project-related production by direct observation beyond the local well field area will be very difficult, as the pumping signal will be very small and likely masked by natural "noise" evident in the water-level and discharge records.

Figure 3 (the "conceptual model") embodies a set of material-property domains, line sinks, prescribed-head boundaries, no-flow boundaries, a recharge area, and an important hydraulic barrier separating domain K1 (the Southern Flow Field) from domain K2+K3 (the Northern Flow Field). Where domain K0 underlies the eastern part of the Reservation, a result of faulting on the Hogan Springs Fault Zone (Schmidt et al., 1996), exploratory drilling of up to 4,000 feet (Johnson et al., 1986) has not encountered Paleozoic carbonate rock. Details of these model elements are given in Appendix B.

Figure 4 depicts the potentiometric surface (water table) in the region of interest, with residuals (differences between computed and observed water levels) indicated. Inflow to the ACRC occurs from the north and west, and diffuse discharge occurs to the south and east. Noteworthy are the relatively flat hydraulic gradients in the Northern and Southern Flow Fields, and the small "step" (two meters or so) between these flow domains resulting from a hydraulic barrier. All regional and local databases and testing analyses to date indicate that the Southern Flow Field in general and the Calpine Project area in particular are favorable for large-scale groundwater production without adverse effects on regional springs.

The modeling analyses that follow address conceptual uncertainty using a set of scenarios that differ in terms of boundary conditions and the effectiveness of the "leaky" hydraulic barrier of Johnson and Mifflin (2003), but otherwise share the same distribution of material-property domains.

Present groundwater development in the Southern Flow Field consists of about 3000 acre-feet per year (afy) (4 cubic feet per second [cfs]) for industrial uses near Apex (in the extreme southern-most extent of K1, Figure 3). Water is used near Apex for gypsum processing in drywall manufacture and power generation, and is somewhat seasonal. Large-scale development in the Northern Flow Field is concentrated near the Muddy River springs and southeastern Coyote Spring Valley in the K3 domain, where up to 14,600 afy (20 cfs) is being withdrawn for irrigation, industrial, and municipal uses, with pumping strongly weighted to the summer months. Water-level fluctuations are uniform throughout the Southern Flow Field and sinusoidal in terms of the shape of the waveform (Figure 5); in the Northern Flow Field, a seasonal pumping signal is superimposed on the natural background, resulting in asymmetrical annual highs and lows.Most if not all of the annual periodicity in both flow fields may be attributable to loading phenomena related to Lake Mead, and this signal component tends to mask the pumping-induced component in Northern Flow Field records. The analysis by Johnson and Mifflin (2006) utilized long-term records from monitoring wells EH-5B and MX-4 in the Northern Flow Field, monthly production totals from all large wells in upper Moapa Valley, and subtracted the annually periodic signal component derived from Southern Flow Field records to perform a well-hydraulics analysis and obtain the parameter estimates that were used for model domain K3. Johnson and Mifflin (2012b) obtained parameter estimates for southeastern Coyote Spring Valley by applying barometric and tidal adjustments to well hydrographs to filter barometric and tidal noise from the water-level signal. Figure 5. Four-year record (1998-2001) of hand measurements and simulated pumping signals in Northern flow field (left), and hourly year-2001 Southern flow field record (right) in which pumping effects appear to be absent. The X-axis on multi-year charts is days beginning January 1, 1997 (the simulation period was five years, 1997-2001). The Hogan Spring Fault Zone is a zone of north-trending fractures and faults extending from the Muddy River spring area southward to the Project area. Western lineaments of the Hogan Spring Fault Zone in the northern portion seem to be fractures without large vertical displacements, and eastern lineaments indicate major faults, juxtaposing fine-grained basin fill on the east against carbonate-rock aquifers on the west. These major faults, in combination with the hydraulic barrier of Johnson and Mifflin (2003), may control the general location of the Muddy River spring area by damming eastward flow of groundwater beyond that area. Two sub-parallel, north-trending lineaments localize spring areas within the general discharge area, and the distribution of paleodischarge deposits has been controlled by the fractures and faults in this area and to the south. North-south ridges are perhaps also related, overprinted on earlier, large-amplitude folds of the Arrow Canyon Range structural block (Page, 1992; Schmidt, et al., 1996). South of the general area of the Muddy River springs, the lineaments are less apparent, perhaps due to the widespread and well-developed pediment surfaces developed on Muddy Creek sediments. However, east of monitoring wells M-1 and TH-2 (Figs. 2, 4) a north-trending fault scarp displaces an old pediment surface, and two local areas of paleodischarge deposits formed on pediment gravels may be localized by the Hogan Spring Fault Zone lineaments. The Hogan Spring Fault Zone is clearly related to Cenozoic extensional tectonics, and the Hogan Spring Fault Zone is part of a larger network of normal faults that created the complex graben containing California Wash and Upper Moapa Valley between the similarly complex Arrow Canyon Range and North Muddy Mountains horsts. In Figures 3 and 4, the K0 finger beneath the eastern part of the Moapa Indian Reservation represents the downfaulted basin sediments of low transmissivity, whereas the K1 domain represents carbonate rock with documented transmissive properties. The hydraulic and hydrochemical databases of the Northern and Southern flow fields (Johnson et al., 2001; Johnson and Mifflin 2003, 2006) suggest limited hydraulic continuity between the two flow-field regions. However, the Hogan Spring Fault Zone extends north and south of the postulated barrier zone, suggesting well-developed hydraulic continuity between the Northern flow field and Southern flow field regions. The two general lines of evidence offer two important conceptual model differences: well-developed hydraulic continuity between Northern flow field and Southern flow field regions, or poorly-developed hydraulic continuity between the two regions. A conceptual model that satisfies both general lines of evidence incorporates upwelling of deeply-circulated waters along fractures of the Hogan Spring Fault Zone. The effect of several "constant-head" zones between the Northern flow field and Southern flow field regions would be to isolate the two flow fields as effectively (or more effectively) than a permeability barrier. In the modeling analyses two general conceptual models are employed to bound the conceptual uncertainty. In the first, the hydraulic barrier of Johnson and Mifflin (2003) is included, in the second the hydraulic barrier is removed. The effects of prescribing head versus prescribing flux at the model boundary are examined for cases with and without the hydraulic barrier, as is a case where a small upwelling (constant-head) is present within a domain that has flux prescribed on its perimeter. Basis for Pumpage Scenarios RES Americas has negotiated a long-term lease for up to 800 afy of water supply. Actual consumptive use of water by RES Americas is likely to be less than 500 afy based on experience with similar generating facilities.The 500 afy used for modeling analyses is a nominal estimate based on the proposed lease amount and experience. Modeling results based on the assumed 500 afy consumptive-use rate are scalable to other rates in almost exact proportions; for example, multiplying a drawdown or discharge reduction resulting from the 500 afy extraction rate by 1.6 gives the impact attributable to an 800 afy rate. Cumulative pumpage to evaluate cumulative impacts is quantified based on the following relationships. The Tribe's permitted water right originated as one of two Las Vegas Valley Water District (LVVWD) 1989 applications for 10 cfs each (7245 afy) that were acted upon by the State Engineer in Ruling 5115. One application was held in abeyance and the other restricted to a permitted total of 2500 afy. Until the full 2500 afy of the Tribe's permitted water right is put to beneficial use and impacts assessed, no production will be allowed from the second LVVWD application. It is unlikely that any other permits in the California Wash hydrographic basin will be issued, as the 1989 LVVWD applications have priority over other large applications in the basin, and the resource base remains uncertain. Therefore, for the foreseeable future, the 2500 afy permitted amount determines the additional pumpage in the basin, and this pumpage will be for Moapa Indian Reservation projects. As the Belly Tank Flat area is central to the Carbonate Aquifer extent in California Wash basin, the full 2500 afy of pumpage has been concentrated in the area of the ECP wells, which as a group are capable of producing nearly twice that amount based on drilling and testing results. It is important to note that future developments using the balance of the 2500 afy of permitted water rights held by the Tribe will likely require EIS reviews, and be incremental additions of pumpage. Records of hydraulic responses to initial pumpage will be available to refine modeling predictions of impacts for added increments of pumpage. Cumulative impacts from Muddy River spring area pumpage and the upgradient Coyote Spring Valley pumpage are addressed by the Memorandum of Agreement (MOA) between the U.S. Fish and Wildlife Service (USFWS), MVWD, SNWA, the Tribe, and Coyote Spring Investments (CSI), all parties to the Memorandum of Agreement as negotiated in 2005 and signed in late 2006. The Memorandum of Agreement provides for limitations on pumpage in Coyote Spring Valley and the Muddy River headwaters area if the impacts on spring flows reach certain decreased flow values, and also potentially limit Tribal pumpage in California Wash basin to 1250 afy of the 2500 afy permit. The Memorandum of Agreement provides for annual monitoring analyses by a Hydrologic Review Team (HRT) to adjust pumpage based on documented impacts on spring flow. Based on the following analyses, we anticipate California Wash basin pumpage will have no significant impacts on Muddy River springs-area flows, although significantly increased pumpage in the Northern Flow Field (upper Moapa Valley and Coyote Spring Valley hydrographic basins) has resulted in reductions of spring discharge and groundwater flux to the headwaters of the Muddy River (Johnson and Mifflin, 2013). All analyses and databases continue to indicate very close hydraulic continuity between Coyote Spring Valley and the Muddy River springs area. Modeling Analyses Based on geologic reconnaissance, analysis of monitoring records, a 7-day aquifer test for parameter estimation, and a thorough review of the literature, a "base case" conceptual model of the hydrologic regime was developed (Fig. 3). Fossil spring deposits in the Project area (Fig. 6) are clear evidence that upwelling of groundwater has occurred in the geologically recent past. Pumping response that almost perfectly fits an upwelling zone co-located with this spring mound two miles from the pumping well (Fig. 7) suggests a "constant head" boundary internal to the model domain related to this ancient spring deposit. That is, the presence of a conduit system that supplies inflow in response to pumping and thereby mitigates drawdowns in the Project area is suggested by the geologic record and by aquifer tests. Figure 6. Fossil spring mound east of monitoring well TH-2, two miles northeast of the Belly Tank Flat well field. This feature indicates past upwelling of groundwater. The MODFLOW grid consists of 36,000 square cells, 1320 feet (402.3 m) on a side.In the west-east direction, the area represents a section extending 45 miles (73 km) from the east flank of the Sheep Range east to the Overton Arm of Lake Mead. From south to north, the area extends 50 miles (81 km) from Las Vegas north to the central Meadow Valley Mountains (Fig. 8). The model domain is uniformly 5000 feet (1524 m) thick, based on the aggregate thickness of Paleozoic carbonate rock in the stratigraphic section and the depth of circulation suggested by groundwater temperatures. The distribution of hydraulic conductivity within the grid is given in Figure 9, inherited from the AEM model (Fig. 3 and Appendix B). No-flow zones are associated with the Las Vegas Shear Zone, southwestward extension of the Kane Springs Wash Fault beneath Coyote Spring Valley, and Weiser Syncline (features B1, B2, and B3, respectively). Boundary conditions were prescribed at the perimeter of the grid and internally for those cases incorporating an "upwelling zone". Utilization of a single model layer, or "two-dimensional" model based on the Dupuit-Forchheimer assumption provides a built-in conservatism by permitting hydraulic continuity between "Northern" and "Southern" flow fields that contain the Muddy River springs and Project area, respectively. Such hydraulic continuity is contra-indicated by the monitoring record, but to achieve greater isolation between the two flow fields in the model some speculative material specifications in the lower Meadow Valley Wash area would be necessary. One modeling challenge is how to supply flow to Rogers and Blue Point springs, the terminus of flow in domain K4, if the hydraulic barrier of Johnson and Mifflin (2003) were to be extended northeastward beyond the Muddy River (Fig. 3) to provide the degree of isolation between K1 and K3 suggested by the monitoring record. A three-dimensional model appears to be desirable in the lower Meadow Valley Wash area, but the absence of the required subsurface information precludes a useful analysis. Ongoing evaluations of industry seismic data by the U.S. Geological Survey (Ric Page, personal communication) may clarify relations in this important area.

Upwelling Model for 7-day Pumping Response at ECP-2

No upwelling occurs 20,000 ft to upwelling zone Drawdown (feet), 10,000 ft to upwelling zone observed ECP-2 response, and 5000 ft to upwelling zone, 2000 ft to upwelling zone. The theoretical response at ECP-2 in Theis aquifer with T=30484.4 ft2/d, S=0.000640805, QECP-1=1005 gpm, and rECP-2= 500 feet. For the preliminary assessment, a set of six conceptual models was explored using MODFLOW, as implemented in the Groundwater Vistas modeling environment. Finite-difference grids for the MODFLOW simulations were extracted from GFLOW analytic element models of the region, which are important precursors to the application of MODFLOW in the Mifflin & Associates (MAI) modeling strategy. By extracting MODFLOW grids from GFLOW, boundary conditions on the grids are derived from calibrated, steady-state models of regional flow rather than being arbitrarily specified. Two analytic element models, one with and one without the hydraulic barrier of Johnson and Mifflin (2003), were developed. MODFLOW grids extracted from the AEM models "inherit" boundary conditions associated with steady-state conditions. For the two contrasting physical-property configurations (barrier and no-barrier), the effects of prescribed-head and prescribed-flux boundary conditions were examined, including a variant of the prescribed-flux case where a small area of prescribed head was included to represent an "upwelling zone". Six conceptual models therefore frame the results given here.

Flux or head conditions at the grid perimeter were inherited from GFLOW steady-state AEM model. Constant-head blocks near the center of the model domain represent the upwelling zone. Calibration assures river flow is near 51 cfs. The hydraulic conductivity distribution for the MODFLOW domain of Figure 7 with and without the hydraulic barrier of Johnson and Mifflin (2003).```

File RESAmericasEISv5.docx A prescribed-head boundary is a region where water levels (heads) are held constant in the simulation, so if drawdowns occur in adjacent areas the flux of water across the prescribed-head boundary increases in response to the increased hydraulic gradient. These "induced inflows" mitigate drawdowns and lessen impacts on groundwater sinks (springs) in the model domain. Prescribed-flux boundaries, on the other hand, are regions where the water level (head) is allowed to vary, but the amount of water entering or leaving the model domain in those regions is held constant. The model solves for head rather than flux along prescribed-flux boundaries, so any water extracted from the model domain must be supplied entirely by flow reductions at existing sinks with no contribution from induced inflow. Reliance on prescribed-head boundaries in the absence of good evidence that prescribed-head boundaries exist is non-conservative, and using only prescribed-flux boundaries is usually overly conservative, since seldom will a model domain have no interaction with a larger region. These are useful constructs, however, to bound what occurs in nature. To evaluate the effects of upwelling within the model domain, suggested by aquifer tests and the presence of groundwater-discharge deposits, a small area of prescribed head was introduced within the model domain, near where the groundwater-discharge deposits occur in nature. Flow reductions in the Muddy River and drawdowns in the Project area were forecast at 10 and 75 years for each conceptual model, giving a total of 12 transient test cases. This approach brackets conceptual uncertainty by exploring a range of intrinsic property and hydrologic boundary effects that influence model predictions. Model Results Two indicators of impact were used to compare the forecast impacts from the various scenarios or "conceptual models" investigated for the Project. These two indicators are drawdown near the proposed Project well field, expressed in feet of decline at a hypothetical monitoring well, and flow reductions at the headwaters of the Muddy River, expressed as percentage decreases from average 2001 River flows (2001 was the first full calendar year of Southern flow field monitoring records, which indicated a hydraulic barrier and the climatic component of regional water-level decline, which in turn allowed a 5-year well hydraulics analysis of the Muddy River springs area and a comprehensive water balance on the Muddy River). Simulated conditions with and without the hydraulic barrier at 10 and 75 years from Project startup were examined. Synthetic (model-derived) hydrographs of a hypothetical monitoring well located approximately 1.3 miles (2 km) west-northwest of the Belly Tank Flat pumping center was used to illustrate a range of possible near-field pumping effects (Fig. 10). The upper four curves represent the predicted drawdowns for the Project life cycle, for cases with and without the hydraulic barrier of Johnson and Mifflin (2003) under two alternative representations of boundary conditions on the model grid (either head or flux retaining prescribed values with time). "Upwelling" cases (lower 2 curves) are the most consistent with pumping response and paleohydrologic evidence (spring mound) and suggest upwelling through localized conduits within the model domain to provide internal recharge boundaries.

File RESAmericasEISv5.docx 75-year Pumping Response Scenarios 2.5 Barrier, Flux BC 2 No Barrier, Flux BC Drawdown (feet) 1.5 Barrier, Head BC 1 No Barrier, Head BC 0.5 Upwelling, Barrier, 0 Flux BC 0 10000 20000 30000 Upwelling, No Barrier, Flux BC Time (days) Figure 10. Predicted drawdowns at a hypothetical monitoring well 1.3 miles from the Project pumping center, for several possible configurations of model boundaries. The responses are nearly identical in upwelling cases. These six cases illustrate how water-level monitoring may provide the basis for discriminating among alternative conceptual models for the hydrogeology of the site. However, great care will be needed to confidently recognize even the larger predicted drawdowns due to system noise, which is known to include periodic and aperiodic signals of frequencies from greater than one per day to less than one per year. Tidal and barometric forcing, loading by rail traffic and possibly surface water, and long-term climate effects all introduce noise to produce the observed water-level signal from which pumping effects must be extracted by digitally filtering the noise from the raw signal. The seven-day aquifer test of 2000, conducted for Calpine Corporation, provides guidance as to how a cone of depression will develop in the Project area.

```The most notable feature of that experiment was a flattening of the drawdown curves after only two days, which the 2001 analysis (Johnson et al., 2001) interpreted as representing delayed yield from unconfined storage (Fig. 11). Predictions of pumping response based on the Neuman model suggest that a resumption of drawdown would have occurred had the test continued 2-3 months longer (Figure 11). The alternative, and currently favored explanation for the flattening is that a recharge boundary was encountered, halting the development of the cone of depression by inducing inflow from an upwelling zone associated with the Hogan Springs Fault Zone (Figs 6 and 7).

The presence of a "constant head" boundary in close proximity to a proposed pumping center will markedly limit pumping cone development over time. Early (2000-2001) models required such an upwelling zone for calibration, but with the recognition of the Johnson/Mifflin hydraulic barrier, an equally credible source for water in the Southern flow field is inflow from the west. Both sources may, in fact, contribute. The varied boundary condition scenarios, with and without the near-field recharge boundary of the Hogan Spring Fault Zone, have been evaluated to bound uncertainty created by differing credible interpretations of the databases.

Modeling results have been summarized in Table 1 in terms of percentage decreases in Muddy River flows (using 2001 flows as the baseline) at 10 and 75 years, resulting from Project withdrawals of 500 acre-feet per year from the ECP-1 locality. At the maximum estimated withdrawal rate of 800 afy, the values in Table 1 should be adjusted upward by a factor of 1.6. At the minimum estimated rate of 350 afy, the Table 1 entries should be adjusted downward by a factor of 0.7.

Table 1 shows model impacts on Muddy River flows, in percent of 2001 flows (nominally 40.5 cfs). Results are linearly scalable to other extraction rates. Minimum impact at both 10 and 75 years (0.10 and 0.14%, respectively, the best-case scenario) is associated with upwelling within the model domain and the presence of a hydraulic barrier, both supported by experimental and observational evidence. Two cases that give minor impact and almost identical results (0.18-0.19 and 0.22%) are those with a) a prescribed head boundary at the grid perimeter, a barrier, and no upwelling; and b) a prescribed flux boundary, no barrier, and upwelling. Intermediate impacts at 10 years (0.35-0.36%) are associated with the absence of upwelling, and either a hydraulic barrier or a prescribed-head boundary at the grid perimeter, but not both.By 75 years the hydraulic barrier has lost effectiveness, so the only "intermediate" case (0.36%) is characterized by a flux boundary at the grid perimeter, no upwelling, and no hydraulic barrier. Maximum impact at both 10 and 75 years (0.60 and 1.21%, respectively, the worst-case scenario) is associated with the absence of both the hydraulic barrier and upwelling, and a prescribed-flux boundary. Even with a hydraulic barrier present, near-worst-case conditions (1.03% flow reduction) apply with a flux boundary and no upwelling. It is evident that a rapid approach to equilibrium would occur with induced inflow from a constant-head boundary, with conditions 10 years after startup expected to offer a good approximation of the ultimate steady state. In contrast, only one-third to one-half of the ultimate impact would be observable at 10 years from startup if flux from the boundary does not respond to new withdrawals, that is, if there is no induced inflow. Nonetheless, forecast reductions to Muddy River flows are still only on the order of one percent at 75 years.

The 7-day aquifer test of 2000 suggests that the "most likely" scenario resembles the "best case", incorporating both the hydraulic barrier of Johnson and Mifflin (2003) and an upwelling zone about 2 miles from the proposed Project well field. Multiple lines of evidence support the hydraulic barrier proposed by Johnson and Mifflin (2006), and the existence of a fossil spring mound the exact distance from ECP-1 as the "best fit" distance in the upwelling zone analysis of Figure 7 strongly suggests that this conceptual model is also valid. Model predictions for the region surrounding upper Moapa Valley are strongly influenced by the type of boundary condition applied to the perimeter of the model grid, especially when forecasting several decades into the future. At 10 years the impacts on Muddy River flows for cases with a prescribed-head boundary average 56% of impacts for cases with a prescribed-flux boundary, but only 26% at 75 years. The effects of a hydraulic barrier separating "Northern" and "Southern" flow fields diminish with time; a hydraulic barrier as represented in the model limits impacts at 10 years to an average of 57% of what would occur in the hydraulic barrier's absence, but at 75 years impacts with a hydraulic barrier average 73% of those without. The presence of an upwelling zone internal to the model domain is suggested by paleo-spring deposits associated with north-trending lineaments, by experimental data that suggest a recharge boundary is encountered by the cone of depression when ECP-1 is pumped, and by monitoring records that suggest a greater degree of isolation between the Northern and Southern Flow fields than that provided by the "leaky" hydraulic barrier extending from the Arrow Canyon Range to the Muddy River springs.

Figure 13 illustrates drawdowns and water levels after 75 years of pumping the full 2500 afy permitted water quantity from the Belly Tank Flat well field, disallowing induced inflow at the model boundaries and incorporating an upwelling zone indicated by experimental data and field evidence. Widespread drawdowns in the 0.5 to 1.5 foot range are projected, which are slightly over five times the contribution of the Project alone. Even these modest impacts reflect over-conservatism at the model boundaries, since induced inflows would occur at the domain boundaries, though locations and quantities cannot be predicted.

The modeling analyses adopting varied but credible boundary conditions all result in rather small impacts compared to natural variations noted in monitoring well records. Since monitoring began in 2000 in the Southern flow field, drought conditions resulted in net annual declines of about 0.3 feet until the spring of 2005. Two key relationships are indicated by these records - all monitoring wells demonstrated the same net declines throughout the large Reservation area, and these declines are comparable to model-forecast declines after decades of pumping. Thus, natural system responses to drought conditions produce larger effects than projected effects of the Project, except in the immediate vicinity of the production wells. The other key observation is that one wet winter wiped out 3-4 years of drought-induced water-level lowering.The Belly Tank Flat well field is associated with the single red grid block beneath the "s" of the Ash Grove label. [case CumulativeUpwell\_75yr.gwv] Natural stresses on the carbonate aquifer result in larger water-level responses than projected pumping impacts per unit of time in most of the model domain. Similarly, the 4 cfs springflow reduction during the recent drought far exceeds future reductions attributable to the Project, though the observed reduction may be due, in part, to pumping in the Northern flow field. Thus separating the pumping-induced water-level declines and flow reductions from natural causes will be difficult, given that projected impacts of the 500 afy Project pumping stress (or even the 2500 afy cumulative impact which would be slightly over five times as great) are well within the envelope of historic variation. Further, the marked recovery of the hydrologic system during a single wet season suggests that, even with pumping stresses larger than modeled, long-term declines may well be offset by short-term recoveries due to exceptional wet years.

Two printed reports from Tetra Tech, describing development of a three-dimensional groundwater flow model and predictions derived from that model, were released in late October 2012, along with a CD containing MODFLOW input files and executable code to allow the simulations to be run (Tetra Tech 2012a, 2012b). The MODFLOW input files contain information on the conceptual model and system geometry, and are sufficient to allow limited comparison with other modeling efforts and results thereof. Unfortunately, Tetra Tech modified the MODFLOW source code to accommodate an assumed hydraulic conductivity versus depth relationship, which effectively prevents users who rely on an execution environment such as Groundwater Vistas from importing the non-standard MODFLOW data files and applying the model to pumping scenarios other than those considered by Tetra Tech. A comparative evaluation of the Tetra Tech model with results presented herein was accomplished by developing a two-dimensional representation of a sub-region of the Tetra Tech model domain (orange outline in Figure 14), based on an equivalent 4000-foot-thick aquifer. The thickness difference (4000 feet versus 5000 feet in earlier modeling work) is immaterial, since transmissivity (the hydraulic conductivity X thickness product) is directly comparable in the two conceptual models. Figure 14, a composite of three Tetra Tech figures with annotation, shows flux boundaries as interpreted by Harrill (2007), production well clusters, an outline of the area with the most detailed and regular (250 X 250 m) gridding in the Tetra Tech model (grid blocks are larger and telescoped to rectangular shapes outside this region), and the smaller, rotated grid utilized by Johnson and Mifflin (2012b) for Order 1169 parameter estimation from short-term pumping response.

Boundary inflow is greatest along segment CSV-3 as delineated by Harrill (2007), and production well clusters are as shown in the Tetra Tech (2012a) model documentation report. The figures that follow represent the area of the detailed grid. As illustrated in Figure 15, in the Tetra Tech model the PC4 (Paleozoic Carbonate Zone 4) aquifer is thickest west of the Meadow Valley Wash Fault, represented in the Model as a high-angle fault as shown in cross-section C-C' which crosses the southern Mormon Mountains and northern Coyote Spring Valley. There is conceptual uncertainty and professional disagreement as to the validity of this representation of the geology. Low-angle fault surfaces with brittle deformation in the Mormon Mountains have been attributed to gravity slides from high-angle fault blocks (consistent with the Tetra Tech model) but alternatively to detachment faulting, perhaps extending beneath the Meadow Valley Mountains). The top of the Tetra Tech model grid corresponds to the static water-level elevation (Figure 16), and the base of the grid is uniformly 15,630 feet below the static water level. The model consists of 18 layers that increase in thickness with depth. The physical properties of hydrogeologic units (HGUs) were distributed through the 1,181,268 model grid cells according to the top and bottom elevations of the HGUs as described by Anderman and Hill (2000). Hydrogeologic Unit PC4 is the primary aquifer in the Coyote Spring Valley - Muddy River Springs area, and is the focus of the present evaluation. The top of Hydrogeologic Unit PC4 occurs at shallow depths (<500 feet) throughout most of the detailed-grid area (Figure 17).Multiple-well aquifer tests (which allow storage properties to be estimated) are known to have been conducted at only three localities in this large region: in the Northern Flow Field at MX-5 by Ertec (1981) and RW-2 (Converse Consultants, 2002), and in the Southern Flow Field at ECP-1 (Johnson and others, 2001; Mifflin and Johnson, 2005).

The thickness of Carbonate-aquifer Unit PC4 varies from zero to the full grid thickness. Saturated Carbonate-aquifer Unit PC4, as represented in the Tetra Tech model, is relatively thin beneath the Arrow Canyon Range and thickest in the Vicinity of Meadow Valley Wash. Carbonate-aquifer Unit PC4 is unconfined over much of the detailed study area; the three multi-well aquifer tests that have yielded storage estimates were conducted under unconfined conditions. Tetra Tech used MAI's first analysis of aquifer tests on the Moapa Indian Reservation (Johnson and others, 2001) as the basis for estimates of specific storage (SS) and specific yield (SYTP) of Carbonate-aquifer Unit PC4. Tetra Tech assigned storage properties dynamically according to the state of saturation of Carbonate-aquifer Unit PC4 in individual grid blocks of layer 1: SS = 1.1 X 10^-6 ft^-1 where saturated, STYP = 0.02 where dewatering. Johnson and Mifflin (2012b) estimated specific yield in the vicinity of MX-5 from responses to the April, 2012 re-start; STYPMAI = 0.003. Tetra Tech assumed that hydraulic conductivity decreases exponentially with depth from the surface value, due to the weight of the overlying rocks. MAI derived transmissivity (ft^2/day) of the Carbonate-aquifer Unit PC4 by summing the (thickness) X (hydraulic conductivity) products of 10 slices across the saturated portion of Carbonate-aquifer Unit PC4 to approximate the depth-dependence of hydraulic conductivity, K. Direct comparison of the Tetra Tech model with MAI's parameter estimation model of 2012 was accomplished by assuming a uniform 4000-foot thickness of an equivalent Carbonate-aquifer Unit PC4, consistent with temperature data which constrains the maximum depth of circulation. By calculating the hydraulic conductivities at the mid-point of ten horizontal slices of the Carbonate-aquifer Unit PC4 aquifer at each xy grid point, then summing the thickness-weighted hydraulic conductivities of the individual slices, the effective hydraulic conductivity for the full Carbonate-aquifer Unit PC4 was derived by MAI to simplify model evaluation. Since effective hydraulic conductivity times thickness gives transmissivity, dividing transmissivity by 4000 feet yields equivalent hydraulic conductivity values for a single layer of uniform 4000-foot thickness. Drawdowns associated with the April, 2012 re-start of MX-5 were analyzed to obtain the aquifer parameters T and Sy by Johnson and Mifflin (2012b). Simulating the pumping response using the equivalent parameter distributions for the Carbonate-aquifer Unit PC4 from Tetra Tech (2012) produces the computed responses. The Tetra Tech model under-predicts drawdowns at all three target wells where drawdown has been resolved; responses were too small to be measured at UMVM-1 after 14 days of pumping, so only predicted responses are shown for that location. The discrepancies may be due in part to the fact that Tetra Tech's computational grid was not refined in the area near MX-5 for this analysis. Specific yield in the Tetra Tech model is, however, higher by a factor of 7 than estimated by Johnson and Mifflin (2012b), and surely delays model drawdowns. When the specific yield is decreased to 0.003, the results are obtained. It is concluded that as boundary conditions come into play, at later times, and as the proportion of pumped water derived from storage decreases, those boundary conditions (flux at input boundaries, head at output boundaries, and distribution of no-flow boundaries) exert the dominant control over pumping responses.Water levels (feet AMSL) from the Tetra Tech 1987 head-save file are used as the initial condition for the Order 1169 simulation [file WT1987.jpg] Figure 17. The depth of the carbonate-aquifer unit PC4 top is shown in feet below the land surface [file DepthToPC4.jpg] 28

247 File RESAmericasEISv5.docx Figure 18. The saturated thickness (feet) of the carbonate aquifer PC4 in the Tetra Tech model is depicted [file PC4satThickness.jpg]. Figure 19. Confined and unconfined conditions (positive and negative values, respectively) are obtained as the difference between the 1987 water level and the top of the PC4 carbonate aquifer (feet AMSL) [file PC4confinement.jpg] 29

248 File RESAmericasEISv5.docx Figure 20. Transmissivity (ft2/day) of the saturated portion of the carbonate aquifer PC4 is based on the Tetra Tech model for decreasing hydraulic conductivity with depth described on pages 27 and 40 and illustrated in Figure 5.1-2 of the Model Development report [file MAI\_HRT20121115.pptx, Slide 12]. Figure 21. The equivalent hydraulic conductivity (ft/day) of the saturated portion of the carbonate aquifer PC4 is based on the Tetra Tech model for decreasing hydraulic conductivity with depth described on pages 27 and 40 and illustrated in Figure 5.1-2 of the Model Development report [file NewKxKy.jpg] 30

249 File RESAmericasEISv5.docx The Tetra Tech model under-predicts drawdowns at all locations where drawdowns have been resolved (confidently identified) after about one day. Tetra Tech's specific yield (0.02), derived by Johnson and others (2001) from aquifer testing in the Southern Flow Field, is 7 times greater than estimated by Johnson and Mifflin (2012b) for the MX-5 area. The overall match to observations is improved by lowering the specific yield of the PC4 aquifer to 0.003, but the pumping responses suggest that unrecognized horizontal flow barriers (HFBs) are present in the model domain, because at greater times more drawdown is observed than is predicted regardless of choice of specific yield. The Tetra Tech model helps explain the lag of several months between pumping in Coyote Spring Valley and the expression of pumping effects as discharge reductions in the headwaters area (Mifflin & Associates, 2010; Johnson and Mifflin, 2011). The time constant of the impulse response function (time to reach 63.2% of the full impact of pumping) is about 4.5 months (Figure 24), likely due to the contribution from storage in the relatively large system domain that was modeled by Tetra Tech as compared to Johnson and Mifflin (2012b). When the model is run using the specific yield derived from near-field responses to MX-5 pumping, 0.003, the time constant is reduced to only about 21 days, consistent with the findings of Johnson and Mifflin (2012b) (Figure 25). An important shortcoming of the Tetra Tech model is that the Tetra Tech model under-predicts Muddy River discharge near Moapa and over-predicts discharge near Glendale (Figure 26). In the words of the authors, "Note that the simulated flow at the gage near Moapa at the beginning of the predictive simulation (approximately 25 cfs) is approximately two-thirds of the observed flow (37 cfs in early 2010)..." (Tetra Tech, 2012b, p. 14). Also, "The average flow measured near Glendale in 2011 was also approximately 37 cfs, but the model simulates additional groundwater and surface water discharge (from Meadow Valley Wash) into the Muddy River upstream of the Glendale gage, producing a simulated flow of approximately 63 cfs at the gage." (Tetra Tech, 2012b, p. 15). The Tetra Tech model is most sensitive to the specification of recharge: "The parameter with the greatest impact on water levels and discharge in the model is the recharge" (Tetra Tech, 2012a, p. 55). USGS records indicate that infiltration losses between the SR168 culvert and Moapa Gage are substantial during runoff events, though infiltration along ephemeral drainages is not represented in the Tetra Tech model. Routing a portion of recharge overland to Pahranagat Wash and allowing this recharge to infiltrate there would partially solve the inconsistency between Moapa- and Glendale-gage records and observations.Subsurface diversion of recharge from Meadow Valley Wash to the west would require revision of the geologic model, perhaps by incorporating a detachment surface beneath the Meadow Valley Mountains. Tetra Tech's approach to model grid design is state-of-the-art, though sparse physical-property data and conceptual uncertainty result in a model system that is extremely over-prescribed. The Tetra Tech model proved too complex for comprehensive review and validation, or for application to other scenarios of interest such as pumping in the Southern Flow Field. The Tetra Tech model distributes fluxes preferentially to upper portions of the system, in contrast to the Exhibit 54 model (LVVWD, 2001), which contained active flow zones at depths of up to 60,000 feet. Re-distribution of recharge would potentially solve the most salient shortcoming of the Tetra Tech model, the model's "miss" with respect to reproducing observed conditions along the Muddy River.

The Tetra Tech model is an important contribution to ongoing efforts to characterize the regional hydrology of southeastern Nevada, but relies on a proprietary version of MODFLOW that is not compatible with execution environments available to third-party reviewers. It is evident that aquifer-parameter distributions govern the timing of impacts to the Muddy River system, while boundary conditions govern the magnitude of the impacts. The Tetra Tech model demonstrates that groundwater withdrawn from the Northern Flow Field is essentially capture of natural flux sustaining the Muddy River, setting the stage for a "perfect storm" with respect to currently-issued groundwater permits (in the up-gradient areas) and Nevada Water Law.

The Tetra Tech model offers the prospect of quantitatively evaluating the upwelling phenomena of the Southern Flow Field that best explain observed pumping response recorded during testing at ECP-1 in the year 2000 (Johnson and others, 2001; Mifflin and Johnson, 2005). However, until Tetra Tech releases Tetra Tech's proprietary MODFLOW source code to developers of MODFLOW execution environments (such as Environmental Simulations, Inc.), and those developers upgrade their products (notably Groundwater Vistas) to incorporate depth-dependence of hydraulic conductivity into the modeling environment, widespread application of the Tetra Tech model will remain impractical.

Outflow Reduction (Tetra Tech Model) as % of MX-5 Pumping Rate 90% 80% Impact at Outflow Boundary 70% 60% 50% 40% % impact 30% (1-exp(-1)) 20% 10% 0% 0 91.25 182.5 273.75 365 Days Since Start of MX-5 Pumping Figure 24. Time required for MX-5 diversions to be expressed as outflow reductions in the headwaters area. The quantity (1-exp(-1)) defines the time constant for the impulse response function, which in this model is about 4.5 months. [file 365dayCHBflux.xlsx, sheet 'NewKeq'; data from TetraTechReviewTR4.gwv] Outflow Reduction (Modified Tetra Tech Model) as % of MX-5 Pumping Rate 100% Impact at Outflow Boundary 80% 60% % impact 40% (1-exp(-1)) 20% 0% 0 91.25 182.5 273.75 365 Days Since Start of MX-5 Pumping Figure 25.Effect of reducing the specific yield of the PC4 aquifer to 0.003, the value estimated by Johnson and Mifflin (2012b) [file 365dayCHBflux.xlsx, sheet 'ReduceSy'; data from TetraTechReviewTR4a.gwv] 34

253 "File RESAmericasEISv5.docx Figure 26. The Tetra Tech model under-predicts Muddy River discharge near Moapa and over-predicts discharge near Glendale. Implications for Monitoring: Regional monitoring-well records will eventually clarify the relative long-term impacts related to drought, pumpage, and exceptional wet years. From what has been observed since 1986, when comprehensive monitoring began in the Muddy River spring area, and since 2000, when comprehensive monitoring began on the Reservation, two periods of drought (1987-1992 and 1998-2004) ended with marked water-level recoveries in exceptionally wet years. Full recovery occurred in the Muddy River springs area in 1992-1993 after five years of net annual declines. In the spring of 2005, after almost 7 years of strong drought and major annual net declines, about 50% of the drought-induced cumulative decline seems to have been eliminated. These historic records of drought-induced declines and wet-year recoveries illustrate the complex nature of the water-level signals (fluctuation patterns) and highlight the analytical challenges, since pumping responses from any likely pattern of development in the Southern flow field are forecast to be smaller than the natural variability. Signal components attributable to pumping can be extracted from the background of natural "noise" attributable to barometric, tidal, and climatic effects by digital signal processing, but digital signal processing requires a level of sophistication beyond standard practice for routine processing of monitoring records. 35"

254 File RESAmericasEISv5.docx Modeling results (Figs. 4, 5, 7, 10, 12, and 13; Table 1) demonstrate that boundaries capable of delivering inflow in response to pumping-induced drawdown in the Project area markedly limit impacts. In general, induced-inflow zones are difficult to locate, but a well-defined cone of depression (as established by water-level monitoring) may demonstrate locations where induced inflow supplements groundwater storage and captures basin outflow as the ultimate sources of Project water. Similarly, the linear extent and transmissive properties of the hydraulic barrier of Johnson and Mifflin (2003) are of continued interest, as these properties govern the time frame over which the hydraulic barrier isolates exploitation impacts of the Northern and Southern flow fields. During the Calpine study of 2000-2003, a five-well monitoring network for the carbonate aquifer was established on the Moapa Indian Reservation and equipped with continuous recorders. One of the systems, at well TH-2, provided uninterrupted hourly measurements of water level and barometric pressure from mid-2000 until mid-2005 (Fig. 27). This monitoring network has proved invaluable in providing the basic data needed to resolve fundamental relationships within the Southern flow field and between the Northern and Southern flow fields. Similarly, records of monthly diversions from upper Moapa Valley, Coyote Spring Valley, and gaging of the Muddy River have been instrumental in attributing losses from the Muddy River system to the origins of these losses. Monitoring Well TH-2 Manual and Automatic Measurements 1815.0 1814.5 Water Level (Feet AMSL) 1814.0 1813.5 1813.0 1812.5 1-Jan-02 2-Jul-02 1-Jan-03 2-Jul-03 1-Jan-04 2-Jul-04 31-Dec-04 2-Jul-05 Date Figure 27. Long-term, drought-related decline in monitoring well TH-2, followed by recovery in the very wet spring of 2005. 36

255 "File RESAmericasEISv5.docx Reconstituted Muddy River Headwaters Flux and EMD Approximation 70 60 Discharge, cubic feet per second 50 Natural Q 40 EMD Trend Observed 30 20 10 Oct-44 Oct-54 Oct-64 Oct-74 Oct-84 Oct-94 Oct-04 Oct-14 Figure 28. When the natural flux reaching the Muddy River headwaters area is reconstituted by accounting for evapotranspiration and all major diversions, a natural variation of 9.7% (5.1 cfs) about the long-term average of 52.9 cfs is demonstrated. "EMD Trend" refers to the sum of low-frequency intrinsic modes of the daily hydrograph, extracted by empirical mode decomposition (EMD).[file ReconstSimple4.xlsx, sheet 'ReconstMR4412EMD'] An important Project monitoring objective is to establish early in the Project life cycle the extent to which induced inflow and the hydraulic barrier affect drawdowns in the Project area. In a seven-day aquifer test in 2000, drawdowns stabilized after only two days, consistent with either unconfined conditions or induced inflow from a nearby upwelling zone. Pinpointing or confirming the presence of a nearby upwelling zone has not been possible, but north-trending faults of the Hogan Springs Fault Zone (Schmidt et al., 1996), which limit the eastern extent of Domain K1 (Fig. 2), could be regional flow conduits, and fossil spring deposits east of monitoring well TH-2 prove that groundwater discharge has occurred in the area in the past. If an upwelling zone is also supported by responses to prolonged pumping, the existence of such a zone would greatly improve the accuracy of groundwater model forecasts in the Project area. Comprehensive groundwater monitoring, designed to establish spatial and temporal trends of water levels in and near the Project area, will lead to an in-depth understanding of the effects of pumping on regional water levels.

The time at which a "crossover" in relative importance between the known hydraulic barrier and any induced inflows occurs will depend on the length and permeability of the hydraulic barrier, the distance to "constant head" zones where inflow may occur, and other factors. The integrated program of monitoring and groundwater modeling will lead to a refined conceptual model from the current set of alternative models, based on monitoring records that most closely approximate model predictions.

Conclusions: A Project pumping stress of up to 800 afy will produce very small impacts in terms of water-level decline or springflow reductions, even after 75 years of pumping. Databases and analyses allow several credible conceptual models, which in turn influence the magnitudes of those small projected impacts in the Muddy River springs area. All scenarios, however, yield very small impacts, within the range of natural variations of water level and spring discharge. It is important to note that the model-forecasted impacts for the various scenarios are theoretical, and natural stresses of larger magnitude and operating at shorter time scales will conceal any Project effects. The cumulative impacts from up to 2500 afy in California Wash basin are, at least theoretically, approaching a level of pumpage that might produce minor impacts over the 75-year Project life cycle in the most conservative (unfavorable) scenarios, with flow reductions approaching 6% of year-2001 Muddy River discharge or less than 5% of the natural flux to the headwaters area (Figure 28). Again, a flow reduction of 6% is well within the >9% range of natural variations and uncertainty in individual surface-water flow measurements. In other words, the forecasted cumulative impacts for the worst-case scenario would still not be large enough after 75 years to be confidently measured or recognized as decreased spring or river flows. Conversely, flow reductions of the order of 6%, which might be detectable by long-term monitoring, would not be attributable to a specific cause without an appropriate theoretical framework (based on monitoring and modeling) in place to evaluate the hydrologic system. Experience indicates that a pumping stress of the order of the full 2500 afy will be required to generate responses that are useful in regional analyses, and anything less will be rendered "invisible" by natural system noise.

A recent analysis by Johnson and Mifflin (2013) suggests the annual periodicity shared by well hydrographs (e.g., Figures 5 and 27) throughout the Arrow Canyon Range Cell of the Carbonate-Rock Aquifer (Mifflin, 1992) is sub-regional in nature and may be related to annual water loading and unloading in the Lake Mead basin. There appears to be propagation of a loading signal from southeast to northwest, accompanied by lag and attenuation that would be forcing from the southeast. The characteristic seasonality is absent in Carbonate-Rock Aquifer monitoring localities 100 miles (160 km) to the north and 100 miles to the west, and the characteristic seasonality is far too large to be accounted for by barometric or tidal forcing. This evidence should dispel the notion that pumping effects from the Apex and Muddy River headwaters areas are being propagated northward and southward, respectively, through an aquifer with nearly infinite hydraulic diffusivity. At present it appears that taking into account the poroelastic effects described by Cavalie and others (2007) may be necessary in any comprehensive analysis.

Key Database Sources: In a comprehensive (regional) study such as this one, the databases and analyses that have been considered are voluminous and cannot be readily incorporated into the reporting. The Bibliography that follows incorporates references either cited or otherwise useful.Hydrogeochemistry (water chemistry and isotopic data bases), apart from water-level databases, constitute the most useful data for regional studies of the carbonate aquifer. Thomas et al. (2001) provided the most comprehensive compilation to date, with only the more limited and recent (2002-2013) information from SNWA monitoring wells in Coyote Spring Valley not included. The interested reader may obtain access to the SNWA Central Data Repository online at www.snwawatershed.org/portal. A user name and password are required for access, and a user name and password may be obtained by contacting the SNWA database administrator, Lisa Atwood, at (702) 862-3790. Prior to these compilations, the Mifflin & Associates, Inc. study (Johnson et al., 2001), published as Appendix D of the Moapa Paiute Energy Center Draft EIS and Supplemental Draft EIS (U.S. Bureau of Indian Affairs and U.S. Bureau of Land Management, 2001), contained the following databases and analyses as appendices: 38"

257 "File RESAmericasEISv5.docx A. ECP-1 aquifer tests summary report; B. Geochemical and isotopic data for the Arrow Canyon Range Cell and surrounding areas; C. Horizontal and vertical elevation control and water levels for carbonate-rock and associated wells located in the Apex, California Wash, Hidden Valley, Coyote Spring Valley, and Moapa areas; D. Nevada State Engineer hydrographic basin abstracts of active water rights status, current through 8/17/00; E. Monitoring plan, Moapa Band of Paiute Indians; F. Summary of groundwater development impacts in the upper Moapa Valley, Nevada. Since these data have been published and are in the public domain, the data are not reproduced herein. In addition to these sources, the annually-published U.S. Geological Survey "Water Resources Data - Nevada" contains streamflow records for the Muddy River and outflow channels of selected springs in the Muddy River springs area. Historical records for daily flows of the Muddy River at the Warm Springs Road gage are available online at http://nwis.waterdata.usgs.gov/nv/nwis/discharge/?site\_no=09416000. 39"

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\*\*263 "File RESAmericasEISv5.docx Appendix A: Stable Isotope Discussion. Trace quantities of the stable (non-radioactive) isotopes hydrogen-2 (deuterium, or "D") and oxygen-18 ("O-18") in the water molecule are natural tracers of groundwater recharge areas, flow paths, and mixing relations. The isotopic composition of a water sample is expressed as "per mil" difference from a standard such as Standard Mean Ocean Water (SMOW); per mil is analogous to percent, but represents parts per thousand. Nearly all terrestrial and meteoric waters are isotopically "depleted" with respect to SMOW, because evaporation from the ocean and precipitation as rain or snow tend to leave deuterium and O-18 behind, first in the ocean and then in the cloud. The higher the latitude or the altitude where the rain or snow falls, the "lighter" the rain or snow tends to be isotopically. The values presented in tables and charts of stable isotope relations are therefore almost always negative numbers. Thomas et al. (2001) provided a compilation of stable isotope data from the southeastern Nevada region, which has been supplemented in recent years by new analyses from Coyote Spring Valley monitoring wells drilled by the Las Vegas Valley Water District and Southern Nevada Water Authority (Fig. A1). Excluding roughly 7% of the samples that constitute outliers (highly evaporated or reflecting experimental error), a very good correlation between values of deuterium and oxygen-18 is evident.\*\*

This version of the document replaces pronouns where needed and ensures that the original meaning is preserved.At the lower left end of the linear cluster of points are the waters from the cooler climates of northern basins, likely containing a component of water recharged during a pluvial climate over ten thousand years ago. At the other end of the cluster are waters of the southern basins and local mountain springs that are subject to more evaporation in the locations where the waters of the southern basins and local mountain springs are found. Samples from the vicinity of the Moapa Indian Reservation plot near the center of the linear cluster of points, which suggests the samples from the vicinity of the Moapa Indian Reservation may be mixtures of end-member waters. Several investigators (Kirk and Campana, 1990; Thomas et al. 1996, 2001) have explored complex mixing relations but the studies of these investigators suffer from the absence of well-defined mixing end-members and therefore the studies of these investigators are inconclusive for that principal reason. Samples from Belly Tank Flat (the Project area) have lighter O-18 compositions than other samples from the local area plotted on Figure A1 inset. Temperatures during drilling and testing of ECP-1 were uniformly near 31 deg C, and TDS is near 1000 mg/l. Though chemically quite different, the possibility exists that Project area waters have affinities with Coyote Spring Valley samples CSVM-2 and CSVM-5 because the isotopic compositions of Project area waters plot parallel to and above the regression line of Figure A1. Well CSVM-5 is located at the southwestern edge of Coyote Spring Valley, in Elbow Canyon at the north end of the Las Vegas Range. Water from CSVM-5 is relatively dilute and the isotopic composition of water from CSVM-5 is relatively heavy, suggesting a modern local recharge component. The TDS of 11 samples collected while drilling the CSVM-5 hole averages 320 mg/l, with no vertical trends evident in the profile. Water from CSVM-5 is cool, 23.4 deg C (average of 4 samples). The static water level of water from CSVM-5 of 2045 feet AMSL further suggests local recharge, and there has been recovery of about a foot over the past two years.

Well CSVM-2 is in South Pass, near US93 at the far south end of Coyote Spring Valley. The water level in CSVM-2 is 1825 feet, having recovered about two feet over the past two years of monitoring. Field temperature data for CSVM-2 are not available. The uppermost waters in CSVM-2 have TDS under 500 mg/l, those deep in CSVM-2 have TDS over 600 mg/l. The isotopic composition of a composite sample from CSVM-2 is intermediate between samples from CSVM-5 and the Belly Tank Flat waters. The relations at CSVM-2 suggest stratification and incomplete mixing of locally-derived waters (represented by CSVM-5) with regionally-derived waters (represented by the ECP-wells in Belly Tank Flat). Whether or not these locally-derived waters are affected by the hydraulic barrier of Johnson and Mifflin (2003) remains unknown, but it is now recognized that there is the possibility of an overprint of the chemical and isotopic signature of locally-derived waters in the upper levels of the carbonate aquifers, particularly in Coyote Spring Valley. The regionally-derived end-member of Northern flow field waters may have been sampled in CSVM-4, a new monitoring well in northeastern Coyote Spring Valley south of Kane Springs Wash. Water from CSVM-4 displays 36.8-degree C water containing 4.74 mg/l fluoride. CSVM-4 has not responded to short-term climatic effects, with water levels in CSVM-4 fluctuating less than a foot from 1874 ft AMSL over the two years of record. The TDS of water from CSVM-4 is 476 mg/l. The isotopic composition of water from CSVM-4 is the most depleted of the Coyote Spring Valley samples. At the other end of the Coyote Spring Valley spectrum is CSVM-7, completed in Pahranagat Wash alluvium at the far north end of Coyote Spring Valley. The relatively high water level of CSVM-7 of 2246 feet AMSL has risen about a foot over the past two years. Water from CSVM-7 is cool (23.6 deg C) with a TDS of 530 mg/l and a fluoride concentration of 1.04 mg/l. It is unlikely that water from CSVM-7 contains a significant component of regional discharge from Pahranagat Valley, being so dissimilar chemically and isotopically to the Pahranagat Valley springs. These relationships reinforce the contention that the Muddy River springs' discharge can not be dominated by underflow from Pahranagat Valley, as postulated by Eakin (1966), but is more likely dominated by underflow from upper Meadow Valley Wash (Panaca Valley) along the general trend of the Delamar Thrust Fault.APPENDIX B. Features and properties of the analytic element model (from Figure 3)

Far-field controls

F1 Corn Creek to Specified heads 892 to 652 m Las Vegas

F2 Divide Well to Specified heads 895 to 867 m Cow Camp

F3 Pahranagat Specified heads 1100 to 900 m Valley

F4 Upper Meadow Specified heads 1500 to 1300 m Valley Wash

F5 Virgin River Specified heads 500 to 450 m

F6 Colorado River Specified heads 250 to 200 m

Inhomogeneities

K0 Far-field zone K=0.064 m/day, obtained by calibration

K1 Southern flow K=6.1 m/day from 7-day aquifer test reported by Johnson et al. (2001). The Southern flow is bounded on the south and west by Las Vegas Shear Zone and Gass Peak Thrust, respectively (Longwell et al., 1965); on the north by a sub-regional hydraulic barrier described by Johnson and Mifflin (2003 and this report), and on the east by down-faulted Tertiary (K0) sediments of California Wash (Johnson et al., 1986; Langenheim et al., 2001, 2002)

K2 Northern flow K=12.2 m/day, obtained by calibration. The Northern flow is bounded on the west by Gass Peak Thrust, on the north by Menard Lake Fault, and on the east by Delamar Mountains Thrust and fold belt (Tschanz and Pampeyan, 1970).

K3 Arrow Canyon K=36.6 m/day from analysis of seasonal pumping response, 1997-2001 (Johnson and Mifflin, 2003 and this report). The Arrow Canyon zone is bounded on the west by a normal fault on the west side of Arrow Canyon Range.

K4 Glendale cell K=5.5 m/day, obtained by calibration. This Glendale cell was reviewed using isotopic data by Pohlmann et al. (1998).

Near-Field Discharge

H1 Muddy River Specified heads 536 to 530 m, hydraulic resistance 1.35 days springs

H2 Rogers / Blue Point Springs Specified heads 488 to 463 m, hydraulic resistance 2.7 days

H3 Southern hydraulic receptor zone Specified heads 450 to 396 m at the south end along Las Vegas Wash, hydraulic resistance 2 days

No-flow barriers

B1 Las Vegas Shear Zone Accounts for a large hydraulic gradient between the Southern flow field (K1) and Las Vegas Valley, and the absence of a candidate outflow component in Las Vegas Valley groundwater (Johnson et al., 2001)

B2 Kane Springs Wash Fault Diverts flow from the north around the area of exposed basement rock in Mormon Mountains (Tschanz and Pampeyan, 1970); a southwestward extension in Coyote Spring Valley is required to fit VF-2 and CSV-3 water levels (Figure 3).

B3 Weiser Syncline Continuous feature per Axen et al. (1990), bent and rotated clockwise at the northern end by Moapa Peak Shear Zone; Weiser Syncline is required to match EH-3 and EH-7 water levels (Figure 3)

Recharge

R1 Sheep Range 0.7 cm/yr in forested highlands, by calibration. The recharge area encompasses 420 km², totaling 2.94 x 10⁶ m³/yr (2380 acre-ft/yr). Previous estimates include 2,000 acre-ft/yr (Eakin, 1966), 5,000 to 6,000 acre-ft/yr (Kirk and Campana, 1990) and 14,000 acre-ft/yr (Thomas et al., 1996).48 267 Appendix G Jurisdictional Waters Determination 282 Appendix H Desert Tortoise Survey Report 283 Moapa Solar Energy Desert Tortoise Survey Report Desert Tortoise Survey Report Moapa Solar Energy Project January 2013 Prepared by: Heritage Environmental Consultants, LLC 284 Table of Contents INTRODUCTION .......................................................................................................................... 1 Solar Power Generation Facility ................................................................................................. 1 Water Supply/Pipeline ................................................................................................................ 3 Transmission Line Options ......................................................................................................... 3 Access Road ................................................................................................................................ 5 Legal Description ........................................................................................................................ 5 Surveyed Species ........................................................................................................................ 7 Agency Consultation History ...................................................................................................... 7 METHODS ................................................................................................................................... 10 Desert Tortoise .......................................................................................................................... 10 Relative Abundance Calculation............................................................................................... 15 Other Sensitive Species............................................................................................................. 15 RESULTS ..................................................................................................................................... 16 Desert Tortoise .......................................................................................................................... 16 Relative Abundance Calculation............................................................................................... 20 Other Sensitive Species............................................................................................................. 20 REFERENCES ............................................................................................................................. 21 APPENDICES Appendix 1 - Survey Data Sheets Appendix 2 - Photographs Appendix 3 - DT Calculation Tables 285 Moapa Solar Energy Desert Tortoise Survey Report INTRODUCTION Moapa Solar LLC (Moapa) proposes to construct and operate the Moapa Solar Energy Center (Project) in northeastern Clark County in southern Nevada. The Moapa Solar Energy Center would consist of a solar power generation facility (SPGF), gen-tie lines that would interconnect the Moapa Solar Energy Center to the regional electrical transmission grid, and an access road between the solar power generation facility and a frontage road along the west side of Interstate 15 (I-15). The solar power generation facility would be located entirely on lands within the Moapa River Indian Reservation, the gen-tie lines would be located on both Reservation and BLM-administered lands, and the access road would be located primarily on BLM-administered lands (Figures 1 and 2). Solar Power Generation Facility The solar power generation facility would be located on the Moapa River Indian Reservation, approximately 20 miles northeast of Las Vegas, Nevada, near Apex, Nevada. Specifically, the solar power generation facility will be located on approximately 1,000 acres of leased tribal lands owned by the Moapa Band of Paiutes. The solar power generation facility would be developed using one or both of two solar technologies - a photovoltaic (PV) project up to 200 Megawatts (MWs) in size and a Concentrated Solar Power (CSP) project up to 140 MWs in size. The final selection of the solar technology that will be employed will be based on the market and/or preferences of the customer for the power. The Moapa Solar Energy Project will be developed pursuant to an executed power purchase agreement (PPA) with a purchasing utility or on a merchant basis where the power output would be sold to customers on the open market. Some customers have a preference of photovoltaic technology or Concentrated Solar Power technology given the difference in operating dynamics, costs, financing parameters, and other development factors associated with each respective technology. Therefore, the Proposed Moapa Solar Energy Project incorporates both Concentrated Solar Power and photovoltaic technology and the final technology selection would be made based on the preferences of the customer(s) for the Moapa Solar Energy Project and prior to construction. Photovoltaic Option The proposed photovoltaic project would be up to 200 MW in size and would utilize crystalline silicon or thin-film photovoltaic panels that would be mounted on single-axis trackers. Using single-axis trackers, the photovoltaic panels will be oriented in north-south rows with the photovoltaic panels moving to track the sun as the sun moves across the sky during the day. Concentrating Solar Power Option 1|Page 286 Moapa Solar Energy Desert Tortoise Survey Report Concentrating Solar Power (CSP) technology focuses sunlight to receivers where the heat is used to produce steam that creates electricity via a conventional steam turbine generator. The primary components of a Concentrated Solar Power project include: cent Solar Field containing mirrors that concentrate sunlight onto solar receivers to create steam. cent Steam Turbine Generator (STG) that converts the thermal energy of the steam to electrical energy for delivery to the grid. cent Thermal Energy Storage (TES) system cent Plant control system that coordinates the functions of the Concentrated Solar Power project components. AREVA Solar's Thermal Concentrating Solar Power (CSP) technology utilizes the Compact Linear Fresnel Reflector (CLFR) system. Rows of solar reflectors focus sunlight onto boiler tubes located in a linear receiver supported on towers approximately 80 feet above the solar reflector field. This system is collectively referred to as the Solar Steam Generator (SSG). The Solar Steam Generator is modular in design utilizing standard steel sections and near-flat mirrors to the sunlight and concentrate it onto a stationary, single receiver located above the solar reflectors. The receiver contains absorber tubes in which water is converted directly to superheated steam. The steam generated in the solar field would be routed to a power block where the steam would be converted to electricity via a steam turbine generator for delivery to the electric grid.The power block will occupy about 40 acres of the Site. The AREVA technology will heat molten salt directly, which molten salt will be stored in tanks. The molten salt will then convert water to steam via a heat exchanger. The MSEC Project proposes to use wet-cooling for the CSP Project. This decision was made for two reasons - because wet-cooling is more efficient than dry or hybrid cooling and because using the Tribe's water for the CSP Project will help the Tribe solidify the Tribe's rights to the water that the Tribe has been allocated. The cooling system for heat rejection from the steam cycle consists of a surface condenser, circulating water system, and a wet cooling tower. The surface condenser is a shell-and-tube heat exchanger with wet, saturated steam exhausted from the low pressure section of the STG condensing on the shell side and circulating water flowing through the tubes to provide cooling. The warmed circulating water exits the condenser and flows to the evaporative cooling tower to be cooled and reused. The mechanical draft cooling tower employs electric motor-driven fans to move air through each cooling tower cell. The cascading circulating water is partially evaporated, and the evaporated water is dispersed to the atmosphere as part of the moist air leaving each cooling tower cell. Because of the arid climatic conditions at the site, visible moisture plumes are expected to occur relatively infrequently and typically only in winter months. No need is expected for a plume-abated cooling tower. No secondary auxiliary cooling system is required. Development and operation of the CSP project would require water. Water uses in a CSP project includes needs for mirror / heliostat cleaning, for the cooling cycle for the steam turbine (makeup to the cooling tower), makeup to the SSG system, service water, potable water and fire protection water. The CSP Project water balance will be based on the various process water flow streams at design ambient conditions. Usage rates will vary during the year and will be higher in the summer. Equipment sizing will be consistent with peak daily rates to ensure adequate design margin. The expected water use for the CSP Project is approximately 600 to 800 acre-feet / year (acf/y) at average ambient operating conditions. Water will be provided to the CSP Project by the Tribe from an existing well located on Reservation lands north of the SPGF site. Water from the developed well will be piped to the SPGF site via the pipeline described below. Water Supply/Pipeline Water for the CSP technology would be provided to the CSP Project by the Tribe from an existing well located in Section 15 about 3.5 miles northeast of the SPGF site. The water would be delivered to the SPGF site via a water pipeline. The water pipeline would originate at the well and would follow existing roads and ROWs from the well to the SPGF site. The CSP Project will generate wastewater streams including wastewater from the cooling tower blowdown and neutralized wastewater from the ion exchange pretreatment system. Process wastewater will be piped to lined, onsite evaporation ponds. The evaporation ponds will be sized to retain all solids generated during the life of the CSP Project. However, if required for maintenance, dewatered residues from the evaporation ponds will be sent to an appropriate offsite landfill as non-hazardous waste. Multiple evaporation ponds covering approximately 50 acres are planned to allow plant operations to continue in the event that an evaporation pond needs to be taken out of service. Each evaporation pond will have enough surface area so that the evaporation rate exceeds the cooling tower blowdown rate at maximum and annual average design conditions. The evaporation ponds will be designed to meet the Best Available Demonstrated Control Technology (BADCT). Transmission Line Options The construction of a new transmission line is necessary to deliver the power generated by the MSEC Project to the electrical grid. One or two gen-tie transmission lines will be constructed based on the customer for the power generated at the SPGF site. The customer will determine whether the power generated by the SPGF site will be delivered to either the Harry Allen Substation (via a 230 kV transmission line) or the Crystal Substation (via a 500 kV transmission line) as different entities can be accessed from each location. The 230 kV or 500 kV transmission line will originate at the MSEC Project substation located on the SPGF site. The gen-tie lines would consist of the following: approximately 7.5 miles of single-circuit 230-kV overhead transmission line from the SPGF site to the Harry Allen 230-kV Substation and approximately 1.5 miles of single-circuit 500-kV overhead transmission line from the SPGF site to the 500 kV Crystal Valley Substation (the configuration of the 500-kV overhead transmission line near the substation is dependent on the results of NV Energy's facility studies and guidance from the studies as to where the 500-kV overhead transmission line would enter the substation).The 230 kV line to Harry Allen would head south from the SPGF site for approximately 2.5 miles until meeting an existing 500-kV transmission line. The proposed transmission line would then follow, on the north side, the existing transmission line for approximately 3.8 miles and then stay north of the Harry Allen 500-kV Substation. Approximately 0.3 mile past the Harry Allen 500-kV Substation, the proposed line would cross an existing 500-kV transmission line at a 90-degree angle and proceed for another 0.4 mile before turning northeast and connecting into the Harry Allen 230-kV Substation on the north side of the Harry Allen 230-kV Substation. This route is approximately 7.5 miles long (Figure 1). The maintenance road associated with the existing 500 kV line will be used to the extent possible for construction and maintenance of the proposed 230 kV transmission line. The design, construction, operation, and maintenance of the transmission lines will 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 landowners' property. Transmission line design will 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). The Project is considering two types of transmission structures for the 230 kV line to the Harry Allen Substation: H-frame and monopole. Figure 2-9 is a diagram showing the typical 230 kV H-frame structure and Figure 2-10 is a diagram showing the typical 230 kV monopole structure. The H-frame and monopole structures for the 230 kV line would range in height from 60 feet to 100 feet. The H-frame would be constructed of wood or steel and the monopole could be constructed of steel. The structures for the 500 kV line to the Crystal Substation would be either steel poles or steel lattice structures. Access Road The Project would require vehicular access for construction, operation, and maintenance. A 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15 would be constructed on BLM-administered lands. From the existing paved frontage road west of I-15, the proposed site access road would follow an existing dirt road for approximately 2.0 miles until the existing paved frontage road west of I-15 reaches the proposed 230 kV gen-tie transmission line ROW which the existing paved frontage road west of I-15 would follow approximately 0.5 mile north to the SPGF site (Figure 1). The access road would be designed to accommodate equipment deliveries, the construction workforce, and, ultimately, the operational needs of the Project. The surface of the access road is proposed to be 30 to 40 feet wide, would be two lanes, and would have adjacent shoulders and drainage swales on either side. The Applicant has requested a 100-foot-wide ROW so the existing road can be straightened if needed in some places. Final design for the access road would be consistent with BLM and Clark County road standards. The access road would be maintained by the Project. Legal Description The SPGF is located in T17S, R64E; and T17S, R63E Mount Diablo Base and Meridian. The legal description, township/range, section, and subdivision for the BLM-administered lands crossed by the transmission lines and access road are shown in Table 1.Table 1 - Township/Range, Section, and Subdivision Information Township/Range Section Subdivision Project Element Transmission Line E 1/2 of W 1/2 Route Access Road 8 NE 1/4 Access Road 16 W 1/2 Access Road Transmission Line 17 E 1/2 of W 1/2 T17S, R64E Route Transmission Line 20 NW 1/4 Route SE 1/4 of NE 1/4, Transmission Line 19 SE 1/4, SE 1/4 of Route SW 1/4 Transmission Line 30 NW 1/4 Route S 1/2 of NE 1/4, Transmission Line T17S, R63E 25 NW 1/4 of SE 1/4, Route SW 1/4 5|Page

290 Moapa Solar Energy Desert Tortoise Survey Report Transmission Line 36 NW 1/4 NW 1/4 Route NE 1/4, SE 1/4 of Transmission Line NW 1/4, SW 1/4, Route 35 SE 1/4 Transmission Line SE 1/4 of SE 1/4 Route W 1/2 of NE 1/4, Transmission Line 36 SE 1/4 of NW 1/4, Route SW 1/4 Transmission Line 9 E 1/2 of SE Route T17S R64E 10 W 1/2 of SW 15 SE 1/4, NE 1/4 Pipeline SW 1/4, NW 1/4 Pipeline 14 NW 1/4, SW 1/4 Pipeline SE 1/4, SW 1/4 Pipeline NW 1/4, NW 1/4 Pipeline 23 SW 1/4. NW1/4 Pipeline SE 1/4, NE 1/4 Pipeline NE 1/4, SE 1/4 Pipeline 22 SW 1/4, SE 1/4 Pipeline SE 1/4, SW 1/4 Pipeline NE 1/4, NW 1/4 Pipeline T16S, R64E 27 NW 1/4, NW1/4 Pipeline SE 1/4, NE 1/4 Pipeline NE 1/4, SE 1/4 Pipeline 28 NW 1/4, SE 1/4 Pipeline SE 1/4, SW 1/4 Pipeline SW 1/4, SW1/4 Pipeline NW 1/4, NW 1/4 Pipeline SE 1/4, SE1/4 Pipeline 33 SW1/4, SE1/4 Pipeline SE 1/4, SW1/4 Pipeline SW 1/4, SW 1/4 Pipeline 6|Page

291 Moapa Solar Energy Desert Tortoise Survey Report Surveyed Species Desert tortoise (Gopherus agassizii), Burrowing Owl (Athene cunicularia), and gila monster (Heloderma suspectum) were identified by the BLM as species of concern for the Project, and the BLM requested that desert tortoise surveys be conducted to determine presence/absence and relative densities within the proposed Project area and alternatives. The BLM also requested that incidental observations of Burrowing Owls and gila monsters be recorded during the desert tortoise survey (Slaughter 2012). Biological surveys for the desert tortoise, Burrowing Owl, and gila monster were conducted previously in 2010 (Nevada Biological Consulting 2010) but because desert tortoise surveys expire after one year, the results of these 2010 surveys became invalid during the spring of 2011. This report documents the results of spring and fall 2012 surveys targeting the aforementioned species on tribal and federal lands to be used by the Project and associated transmission interconnection and access road options. Agency Consultation History The Project and Project biologists participated in several phone calls with the USFWS and BLM prior to surveys in 2012. Patrick Golden contacted Michael Burrows, Fish and Wildlife Biologist, USFWS in February 2012 and again in April 2012 to verify the use of the 2010 survey protocol and to verify the appropriate survey timing. Patrick Golden also contacted Mark Slaughter, Wildlife Biologist, BLM in April 2012 to verify which special status species, in addition to the desert tortoise, should be surveyed concurrently with desert tortoise surveys. The applicant contacted the USFWS in October 2012 to discuss the Fall 2012 survey plan.7|Page

292 29 Legend 25 30 29 28 27 26 28 L i n c o l n 27 26 U TA H Interstate Nye County County Railroad N E VA D A Township 16S Township 16S Proposed Access Road PROJECT LOCATION Mohave Range 64E - 100' ROW County Range 63E 35 34 Proposed Transmission Lines Inyo Clark 36 32 33 County 35 31 County 33 34 230-kV Transmission 32 Solar Power Generation Line Option A ARIZONA Facility Boundary CALIFORNIA 230-kV Transmission Line Option B San Bernardino 500-kV Transmission County Line Option A 10 11 Additional 500-kV 07 08 09 Crystal 09 10 11 12 Substation Transmission Survey Corridor Township/Range Boundary PLSS Section Line 16 15 14 Existing Substation 14 13 18 17 Boundary 16 15 Solar Power Generation 15 Facility Boundary Unsuitable Desert Tortoise Habitat Township 17S Township 17S Jurisdictional Land Ownership Rnage 63E Range 64E 23 Bureau of Land 21 22 Management Land 19 20 23 24 21 22 Indian Land CLARK COUNTY Dry Lake oad tag eR 27 26 0 0.5 1 1.5 29 28 25 30 28 27 26 Fro n Miles Universal Transverse Mercator North American Datum 1983 Zone 11 North, Meters Moapa Solar Energy Center 34 35 33 36 31 33 34 35 32 FIGURE 1 - PROJECT AREA Harry Allen Power Plant Map Extent: Clark County, Nevada Harry Allen 03 02 Date: 09-26-12 Author: djb 06 05 04 04 03 02 Substation 01 I:\Moapa Solar/MXD's/DT\_Figure1\_Project Area\_11x17 072712.mxd

293 Iron County Legend Lincoln U TA H County Interstate Nye Washington County County N E VA D A Railroad 13 PROJECT LOCATION 18 Mohave County 17 16 15 14 Proposed Access Road Inyo Clark Water Pipeline County County ! ! ! ! Option A to Harry Allen ARIZONA Substation CALIFORNIA CLARK COUNTY Path 1 to Crystal ! ! ! ! San Bernardino County Substation Water Pipeline ROW Township/Range Boundary 23 Moapa River 22 24 19 21 Indian 20 Reservation PLSS Section Line Proposed Solar Site Boundary Jurisdictional Land Ownership Township 16S Bureau of Land Range 63E Management Land Indian Land 27 26 25 30 29 28 Township 16S Range 64E 0 0.5 1 Miles Universal Transverse Mercator North American Datum 1983 Zone 11 North, Meters 34 35 33 36 31 32 Moapa Solar Energy Center ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! Figure 2 - Water Pipeline Project Area 07 ! 11 ! Proposed Solar ! Township 17S 12 Map Extent: Clark County, Nevada 10 ! 08 09 15 Site Boundary ! ! Range 64E ! Date: 11-20-12 Author: rnc ! ! I:\Moapa Solar/MXD's/Water Pipeline\_112012.mxd ! ! ! ! ! 294 Moapa Solar Energy Desert Tortoise Survey Report METHODS Desert Tortoise The desert tortoise survey methodology employed was designed to determine presence/absence and abundance of desert tortoises within the Project area. The desert tortoise survey methodology is the Pre-project Field Survey Protocol for Potential Desert Tortoise Habitats (USFWS protocol) described in the "Preparing For Any Action That May Occur Within The Range Of The Mojave Desert Tortoise" (Gopherus agassizii; USFWS 2010). The information gathered is intended to: 1. Determine the appropriate level of consultation with the U.S. Fish and Wildlife Service (USFWS) and Nevada Department of Wildlife (NDOW); 2. Determine the amount of incidental take of Desert Tortoises resulting from the Project as defined by the Endangered Species Act (ESA) and state laws; and 3. Assess the distribution of Desert Tortoises to help minimize and avoid take. Based on the most recent USFWS protocol (USFWS 2010), a site assessment is conducted within the survey area to determine the suitability of the habitat for Desert Tortoise.Pursuant to the protocol, if the survey area is large (> 40 acres), surveys should be conducted during the Desert Tortoise's most active periods (April through May or September through October) when air temperatures are lower than 104F. The USFWS guidance also indicates that projects smaller than 2,789 acres that are located within the North-East Mojave: North Recovery Unit must complete 100% coverage surveys. Therefore, probabilistic sampling was not an option for the Project, so ten-meter wide belt transects were used during the survey and were designed to cover the entire Project area (100 percent coverage). The sampling protocol implemented for this survey was reviewed and approved by the USFWS prior to implementation. Occurrences of either live desert tortoises or desert tortoise sign in the survey area were used to indicate desert tortoise presence. The Project site, transmission line ROWs, and access road ROWs were surveyed with ten-meter transects ensuring 100 percent coverage of those areas. If neither actual desert tortoises nor sign thereof were encountered during the surveys in any given portion of the Project (e.g., a particular transmission interconnection corridor), three additional 10-m belt transects at 200-m intervals parallel to and/or encircling the Project area perimeter (200- m, 400-m, and 600-m from the perimeter of the Project site) were also surveyed. These transects were used to determine the presence/absence of desert tortoise, but the transects were not included in the estimation of desert tortoise abundance. Two separate desert tortoise surveys were conducted. The first survey took place in May of 2012 and surveyed the SPGF, access roads and transmission lines (Figures 3a, 3b, and 3c). The second survey was conducted in October of 2012 that surveyed the water pipeline (Figure 4). All observed desert tortoise sign were mapped and recorded. Sign included scat, burrows, live tortoises, carcasses, shell fragments, eggshells, tracks, courtship rings, and drinking depressions.The provided text appears to be a structured data or a legend description rather than a continuous prose narrative. This type of content primarily involves lists of terms and annotations related to maps or figures that do not include traditional discourse elements such as pronouns or subjective references that can undergo standard coreference resolution.

To apply coreference resolution meaningfully, the text would need to be in a narrative format with identifiable entities and pronouns referring back to those entities. If you have another section of text you would like to revise for coreference resolution, please share it in narrative form.Path 1 to Crystal Substation WP 14 ( ! Water Pipeline ROW WP 13 ! ( Township/Range WP 01 Boundary ! ( Moapa River 22 23 24 19 21 Indian 20 Reservation PLSS Section WP 04 ! ( WP 02 ! ( WP 12 ! ( WP 03 Line WP 11 ! ! ( ( WP 05 WP 18 ! ( Proposed Solar Site Boundary WP 10 Jurisdictional Land Ownership ( ! Township 16S Bureau of Land Range 63E Management Land Indian Land (! ! ! ( ( WP 06 WP 07 WP 08 26 25 30 29 28 27 WP 09 ( ! Township 16S Range 64E 0 0.5 1 Miles Universal Transverse Mercator North American Datum 1983 Zone 11 North, Meters 34 35 33 36 31 32 Moapa Solar Energy Center ! ( WP 16 ! ! ! ! ! ! Figure 4 - Water Pipeline Desert Tortoise Observations ! ! ! ! ! ! ! ! ! 07 ! 11 ! Proposed Solar ! Township 17S 12 Map Extent: Clark County, Nevada 10 ! 08 09 15 Site Boundary ! ! Range 64E ! Date: 11-20-12 Author: rnc ! ! I:\Moapa Solar/MXD's/Water Pipeline DTObservations\_112012.mxd ! ! ! ! ! 299 Moapa Solar Energy Desert Tortoise Survey Report Relative Abundance Calculation Desert tortoise population estimates were generated based on recommended methodologies contained in USFWS (2010). These estimates were generated for all Moapa Solar Energy Center components for which there were detections of adult desert tortoise. Population estimates were generated using the following equation: n ( A) N^ = \* ( Pa )(Pd ) (a) Where N is the corrected population estimate, n is the number of Desert Tortoises observed, Pa is the probability a Desert Tortoise in the Moapa Solar Energy Center area would be above ground based on previous winter precipitation per USFWS (2010). For Table 3 calculation of the May 2012 Moapa Solar Energy Center survey and the October 2012 Moapa Solar Energy Center survey, a value of 0.8 was used (Western Regional Climate Center 2012), Pd is the probability that an above-ground Desert Tortoise would be detected (0.63), A is the size of the Moapa Solar Energy Center area, and a is the size of the area surveyed. Corrected estimates are reported here with 95% confidence intervals (CI) per USFWS (2010). Other Sensitive Species Surveys for Burrowing Owls and gila monsters were conducted concurrently with desert tortoise surveys. Individuals and/or sign were recorded and mapped. In the case of Burrowing Owls, potentially suitable burrows were checked for Burrowing Owl sign (prey items, scratches, scat, pellets, feathers, etc.). 15 | P a g e

300 Moapa Solar Energy Desert Tortoise Survey Report RESULTS Desert Tortoise Most of the Moapa Solar Energy Center area represents potentially suitable habitat for the desert tortoise. The Moapa Solar Energy Center area is largely dominated by Mojave creosote-bush scrub vegetation. This vegetation class includes Mojave mixed scrub and creosote-bursage vegetation. Dominant species associated with this vegetation community include shadscale (Atriplex confertifolia), brittlebrush (Encelia farinosa), creosote (Larrea tridentata), bursage (Ambrosia dumosa), and desert saltbush (Atriplex polycarpa) that occur on lower slopes and in washes. Associate species also included Mojave yucca (Yucca schidigera), Mormon tea (Ephedra nevadensis), range ratany (Krameria parvifolia), desert trumpet (Eriogonum inflatum), big galleta (Hilaria rigida), and Indian ricegrass (Oryzopsis hymenoides). The portion of the transmission interconnection (approximately 1.7 miles in length) that traverses Dry Lake is not suitable desert tortoise habitat and was not surveyed (Figures 1, 3B, and 3C). This area of Dry Lake was almost completely unvegetated with hard-packed soils, often with an alkali crust. Based on the lack of vegetation, there is no forage or cover present for desert tortoises. This portion of Dry Lake is also occasionally completely inundated; precluding desert tortoises from occupying burrows. Small portions of this area of Dry Lake were spot sampled - suitable burrows were not found, nor were soil conditions conducive for burrow excavation. The vegetated margins of Dry Lake bed were surveyed since these areas of Dry Lake bed represented potentially suitable foraging areas; though soils in these areas of Dry Lake bed were still extremely hard packed.Near the south end of the transmission interconnection, the habitat becomes steeper with rockier soils and greater components of cholla (Cylindropuntia sp.), Mojave yucca, and prickly pear (Opuntia sp.). The habitat area is crossed by several small ephemeral drainages that extend from a large sloping bajada extending from the southwest. Desert tortoise and desert tortoise sign were observed in the Project area. An adult desert tortoise and suitable desert tortoise burrows were observed within the Solar Power Generating Facility site; desert tortoise sign and potentially suitable burrows were observed along the 230-kV Transmission Line Alternative - Option A (which overlaps with a portion of the buffer area associated with the 230-kV Transmission Line Alternative - Option B); an adult desert tortoise and potentially suitable burrows were observed along the buffer transects associated with the 500-kV Transmission Line Alternative; one potentially suitable burrow occurred along the access road, two adult and one subadult desert tortoise, and fourteen suitable burrows were observed along the pipeline ROW (Table 2a and 2b, Figures 3a, 3b, 3c, and 4).

Table 2a - Desert Tortoise Sign and Observations. May 2012 Survey Observation Transect Project Component GPS ID Notes Description: Solar Power 1 Class 4 burrow SF001 Generating Facility; Solar Power 6 Class 5 burrow SF002 Generating Facility; Solar Power 10 Class 3 burrow PG003 Scat present Generating Facility; Solar Power 12 Class 3 burrow SM001 Scat present Generating Facility; Tortoise not in Solar Power 14 Desert Tortoise PG004 burrow; Generating Facility 280mm MCL Egg fragments; Solar Power 19 Class 3 burrow PG006 present; in a wash at the Solar Power Generating Facility; Solar Power Located in 20 Class 6 burrow PG005 Generating Facility small rivulet; Solar Power 21 Class 4 burrow SF004 Generating Facility; Solar Power Class 6 burrow TM001 No sign Generating Facility 23; Solar Power Class 4 burrow TM002 Scat present Generating Facility; Solar Power 32 Class 6 burrow SY001 Generating Facility; Solar Power 38 Class 3 burrow SF005 Generating Facility; Solar Power 40 Class 4 burrow SM003 Generating Facility; Solar Power 43 Class 4 burrow PG007 No sign Generating Facility; Solar Power 45 Class 3 burrow SF006 Generating Facility.

Table 2b - Desert Tortoise Sign and Observations. Oct. 2012 Survey: Solar Power 62 Class 4 burrow SY002 Generating Facility; Solar Power 70 Class 3 burrow SM004 Creosote flat Generating Facility; Solar Power Partially filled 85 Class 6 burrow PG008 Generating Facility; Solar Power Near coyote 115 Class 4 burrow PG009 Generating Facility den; Solar Power 116 Class 6 burrow SY003 Generating Facility No sign; near Access 400W Access Road Class 5 burrow PG011 rivulet; 500-kV Transmission Class 5 burrows Two burrows; Crystal 400N PG012 Line (buffer) (x2) no sign; Desert tortoise 500-kV Transmission Crystal 600N Desert Tortoise SFDT01 in burrow; Line (buffer) 250mm MCL; Estimated time 230-kV Transmission Shell fragments HA1 TM003 since death: >4 Line - Option A and scutes years; Estimated time 230-kV Transmission HA1 Shell fragments TM004 since death: >4 Line - Option A years; 230-kV Transmission Very fresh sign HA2 Class 1 burrow SY004 Line - Option A at entrance; 230-kV Transmission HA3 Class 3 burrow PG010 Shell fragments Line - Option A; 230-kV Transmission HA4 Class 5 burrow CB001 Line - Option A; 230-kV Transmission HA4 Class 3 burrow CB002 Line - Option A; 230-kV Transmission No sign; upper HA5 Class 3 burrow SM005 Line - Option A bajada; No sign: upper 230-kV Transmission HA5 Class 3 burrow SM006 bajada near Line - Option A wash. Subadult.Not 1 Pipeline Desert Tortoise WP 09 in burrow 2 Pipeline Class 3 burrow WP 01 No sign 2 Pipeline Class 2 burrow WP 02 No sign 2 Pipeline Class 3 burrow WP 03 No sign 2 Pipeline Class 2 burrow WP 04 No sign Class 1-2 2 Pipeline WP 05 Tracks burrow 2 Pipeline Class 2 burrow WP 06 No sign 2 Pipeline Class 3 burrow WP 07 No sign 2 Pipeline Class 5 burrow WP 08 No sign 3 Pipeline Class 2 burrow WP 18 No sign 3 Pipeline Class 2 burrow WP 17 No Sign 3 Pipeline Shell Frags WP 16 Carcass Adult. Not in 4 Pipeline Desert Tortoise WP 10 Burrow Adult .Not 4 Pipeline Desert Tortoise WP 15 completely in burrow 5 Pipeline Class 1 burrow WP 11 Scat 5 Pipeline Class 3 burrow WP 12 No sign 5 Pipeline Class 1 burrow WP 13 No sign 5 Pipeline Class 2 burrow WP 14 No sign 1 Burrow Class 1 - Definitely Desert Tortoise - Fresh; Class 2 - Definitely Desert Tortoise - Not Fresh But Active This Season/Year; Class 3 - Definitely Desert Tortoise - Good Condition But Not Active This Season/Year; Class 4 - Possibly Desert Tortoise - Good Condition But Unsure of Species; Class 5 - Definitely Desert Tortoise - Deteriorated (Not This Season/Year); Class 6 - Possibly Desert Tortoise - Deteriorated. 19 | P a g e

304 "Moapa Solar Energy Desert Tortoise Survey Report Relative Abundance Calculation As detailed in the 2010 USFWS protocol, corrected desert tortoise estimates are calculated upon completion of the field surveys. These calculations were performed using the USFWS interactive Table 3, included in the 2010 Pre-project Survey Protocol (USFWS 2010). The USFWS interactive Table 3 calculates desert tortoise populations based on the number of adult tortoises observed during surveys, as described in the Relative Abundance Calculation section, above. Results from the May 2012 Table 3a calculations indicate approximately 2.0 Desert Tortoises are expected to occupy the SPGF Project area (95%CI: 0.36-10.64). Results from the October 2012 Table 3b calculations indicate approximately 6.8 Desert Tortoises are expected to occupy the pipeline ROW (95%CI: 1.98-23.11). A copy of the completed "Table 3a and Table 3b" is included in Appendix 3. Desert tortoises are expected to be present along the proposed access road and all transmission alternatives (Both 500-kV route as well as 230-kV routes) based on the presence of sign and/or suitable burrows, though population estimates are not possible because adult desert tortoises were not detected. An adult desert tortoise was observed in the buffer area associated with the 500-kV Transmission Line alternative; however, tortoises located in buffer areas are not used to generate relative abundance estimates. Other Sensitive Species No gila monster or Burrowing Owl sign or individuals were observed during the spring or fall surveys. The Project area represents potentially suitable habitat for Burrowing Owls. Potentially suitable Burrowing Owl burrows were relatively scarce, though present at the Project site. None of the potentially suitable Burrowing Owl burrows showed evidence of recent occupancy by Burrowing Owls (scat, scratches, feathers, prey items, pellets, etc.) and no Burrowing Owl individuals were observed during pedestrian desert tortoise surveys or incidentally while driving in or around the Project area. Gila monsters are known to occupy a variety of vegetation types across their range including desert scrub, thorn scrub, pinyon-juniper or oak woodlands and rarely agricultural habitats. Most frequently, the gila monster species is found on low slopes or canyon bottoms with relatively steep rocky slopes. Burrows are important for gila monsters as is temporary shelter. Gila monsters spend 95-98% of their lives underground (NatureServ 2012). Several potentially suitable gila monster burrows were observed during the surveys but no sign of gila monster activity was observed at any of the potentially suitable gila monster burrows. No gila monster individuals were observed, though sightings of gila monster individuals are relatively uncommon given the amount of time gila monsters spend underground. May is considered the most active month for gila monsters in Nevada (Nevada Department of Wildlife 2012). 20 | P a g e"

305 Moapa Solar Energy Desert Tortoise Survey Report REFERENCES Burrows, M. 2012.Personal communication [April 11 telephone conversation with P. Golden, Heritage Environmental Consultants, Denver, Colorado. RE: Desert tortoise survey timing and protocol]. Fish and Wildlife Biologist, USFWS Southern Nevada Fish and Wildlife Office, Las Vegas, Nevada. 1 page. NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: July 30, 2012). Nevada Biological Consulting, LLC. 2010. Biological Survey Report: Moapa Solar Project, Clark County, Nevada. June, 2010. 36pp. Nevada Department of Wildlife (NDOW). 2012. Nevada Fauna Facts: Banded Gila Monster. http://ndow.org/wild/animals/facts/gila.shtm. (Accessed: July 30, 2012). Slaughter, M. 2012. Personal communication [April 25 telephone conversation with P. Golden, Heritage Environmental Consultants, Denver, Colorado. RE: Additional special status species to survey for concurrently with desert tortoise surveys]. Wildlife Biologist, BLM Las Vegas Field Office, Las Vegas, Nevada. 1 page. U.S. Fish and Wildlife Service (USFWS). 2010. Preparing For Any Action That May Occur Within the Range of the Mojave Desert Tortoise (Gopherus agassizii). 18 pages. Western Regional Climate Center. 2012. Online data for North Las Vegas, NV. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?nv5705. (Accessed July 25, 2012). 21 | P a g e

306 Moapa Solar Energy Desert Tortoise Survey Report Appendix 1 - Survey Data Sheets

319 Moapa Solar Energy Desert Tortoise Survey Report Appendix 2 - Photographs Representative creosote bush-white bursage scrub on solar site (May 2012) Tortoise in burrow on transmission option C/D (May 2012)

320 Moapa Solar Energy Desert Tortoise Survey Report Representative habitat near Harry Allen substation (May 2012) Dry lakebed on transmission interconnection option A/B (unsuitable habitat) (May 2012)

321 Moapa Solar Energy Desert Tortoise Survey Report Example of suitable burrow on water pipeline ROW (Oct 2012) Representative habitat on the water pipeline ROW (Oct 2012)

322 Moapa Solar Energy Desert Tortoise Survey Report Live desert tortoise observed on water pipeline ROW (Oct 2012)

323 Moapa Solar Energy Desert Tortoise Survey Report Appendix 3 - USFWS "Table 3" Relative Abundance Calculation

324 Table 3. USFWS Desert Tortoise Pre-Project Survey Guidance What is the estimated number of tortoises and associated 95% confidence interval for the action area? INSTRUCTIONS Use this tab when all your transects were of equal length. Enter the appropriate values from the survey into the yellow cells below. The number of tortoises and associated 95% confidence interval for the action area will be calculated. N = 2.0 Lower 95%CI = 0.36 Upper 95%CI = 10.64 Total action area (acres) 850 Probability that a tortoise is above ground given winter rainfall 0.800 (Pa from Table 2) = Total length of transects walked (L, km) = 348 Transect length (km) 2 Number of transects walked (k) = 174 Number of tortoises found during surveys (n) = 1 Transects all the same length Number of transects on which tortoises were found (n\_i) (n\_i) = Number of tortoises sum(l\*((n\_i/l) - (n/L))^2) 0 173 0.002857048 1 1 0.494269388 2 0 0 3 0 0 4 0 0 5 0 0 6 0 0 7 0 0 8 0 0 9 0 0

325 October 2012 Survey Table 3. USFWS Desert Tortoise Pre-Project Survey Guidance What is the estimated number of tortoises and associated 95% confidence interval for the action area? INSTRUCTIONS Use this tab when all your transects were of equal length. Enter the appropriate values from the survey into the yellow cells below. The number of tortoises and associated 95% confidence interval for the action area will be calculated.N= 6.8 Lower 95%CI = 1.98 Upper 95%CI = 23.11 Total action area (acres) 177 Probability that a tortoise is above ground given winter rainfall (Pa 0.800 from Table 2) = Total length of transects walked (L, km) = 42 Transect length (km) 8 Number of transects walked (k) = 5 Number of tortoises found during surveys (n) = 2 Transects all the same length Number of Number of transects on which tortoises were seen (n\_i) sum(l\*((n\_i/l) - (n/L))^2) (n\_i) tortoises were seen 0 3 0.057142857 1 2 0.085714286 2 0 0 3 0 0 4 0 0 5 0 0 6 0 0 7 0 0 8 0 0 9 0 0

326 Appendix I Cultural Resource Consultation

354 Appendix J Visual Rating Sheets

362 Appendix K Hazardous Radius Report

363 Radius Report http://www.geo-search.net/QuickMap/index.htm?DataID=Standard0000057765 Click on link above to access the map and satellite view of current property Target Property: Moapa Clark County, Nevada 89406 Prepared For: Satisfi Order #: 25468 Job #: 57765 Project #: 16001-001 Date: 05/21/2013 phone: 888-396-0042 fax: 512-472-9967 www.geo-search.com

364 TARGET PROPERTY SUMMARY Moapa Clark County, Nevada 89406 USGS Quadrangle: Arrow Canyon Se, NV Target Property Geometry: Area Target Property Longitude(s)/Latitude(s): (-114.869818, 36.491375), (-114.870020, 36.508944), (-114.845648, 36.508781), (-114.846086, 36.491429), (-114.869818, 36.491375) County/Parish Covered: Clark (NV) Zipcode(s) Covered: Overton NV: 89040 State(s) Covered: NV \*Target property is located in Radon Zone 3. Zone 3 areas have a predicted average indoor radon screening level less than 2 pCi/L (picocuries per liter). This report was designed by GeoSearch to meet or exceed the records search requirements of the All Appropriate Inquires Rule (40 CFR 312.26) and the current version of the ASTM International E1527, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process or, if applicable, the custom requirements requested by the entity that ordered this report. The records and databases of records used to compile this report were collected from various federal, state and local governmental entities. It is the goal of GeoSearch to meet or exceed the 40 CFR 312.26 and E1527 requirements for updating records by using the best available technology. GeoSearch contacts the appropriate governmental entities on a recurring basis. Depending on the frequency with which a record source or database of records is updated by the governmental entity, the data used to prepare this report may be updated monthly, quarterly, semi-annually, or annually. Disclaimer - The information provided in this report was obtained from a variety of public sources. GeoSearch cannot ensure and makes no warranty or representation as to the accuracy, reliability, quality, errors occurring from data conversion or the customer's interpretation of this report. This report was made by GeoSearch for exclusive use by GeoSearch's clients only. Therefore, this report may not contain sufficient information for other purposes or parties. GeoSearch and GeoSearch's partners, employees, officers, and independent contractors cannot be held liable for actual, incidental, consequential, special, or exemplary damages suffered by a customer resulting directly or indirectly from any information provided by GeoSearch.www.geo-search.com phone: 888-396-0042 fax: 512-472-9967

365 DATABASE FINDINGS SUMMARY SEARCH LOCA- UNLOCA- RADIUS DATABASE ACRONYM TABLE TABLE (miles) FEDERAL AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY AIRSAFS 0 0 Target Property SUBSYSTEM BIENNIAL REPORTING SYSTEM BRS 0 0 Target Property CLANDESTINE DRUG LABORATORY LOCATIONS CDL 0 0 Target Property EPA DOCKET DATA DOCKETS 0 0 Target Property FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES EC 0 0 Target Property EMERGENCY RESPONSE NOTIFICATION SYSTEM ERNSNV 0 0 Target Property FACILITY REGISTRY SYSTEM FRSNV 0 0 Target Property HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM HMIRSR09 0 0 Target Property INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY ICIS 0 0 Target Property DOCKETS) INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL ICISNPDES 0 0 Target Property POLLUTANT DISCHARGE ELIMINATION SYSTEM MATERIAL LICENSING TRACKING SYSTEM MLTS 0 0 Target Property NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM NPDESR09 0 0 Target Property PCB ACTIVITY DATABASE SYSTEM PADS 0 0 Target Property PERMIT COMPLIANCE SYSTEM PCSR09 0 0 Target Property RCRA SITES WITH CONTROLS RCRASC 0 0 Target Property CERCLIS LIENS SFLIENS 0 0 Target Property SECTION SEVEN TRACKING SYSTEM SSTS 0 0 Target Property TOXICS RELEASE INVENTORY TRI 0 0 Target Property TOXIC SUBSTANCE CONTROL ACT INVENTORY TSCA 0 0 Target Property NO LONGER REGULATED RCRA GENERATOR FACILITIES NLRRCRAG 0 0 Target Property and Adjoining RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR RCRAGR09 0 0 Target Property and Adjoining FACILITIES HISTORICAL GAS STATIONS HISTPST 0 0 0.2500 BROWNFIELDS MANAGEMENT SYSTEM BF 0 0 0.5000 COMPREHENSIVE ENVIRONMENTAL RESPONSE, CERCLIS 0 0 0.5000 COMPENSATION & LIABILITY INFORMATION SYSTEM www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DATABASE FINDINGS SUMMARY 1

366 DATABASE FINDINGS SUMMARY SEARCH LOCA- UNLOCA- RADIUS DATABASE ACRONYM TABLE TABLE (miles) LAND USE CONTROL INFORMATION SYSTEM LUCIS 0 0 0.5000 NO FURTHER REMEDIAL ACTION PLANNED SITES NFRAP 0 0 0.5000 NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES NLRRCRAT 0 0 0.5000 OPEN DUMP INVENTORY ODI 0 0 0.5000 RESOURCE CONSERVATION & RECOVERY ACT - TREATMENT, RCRAT 0 0 0.5000 STORAGE & DISPOSAL FACILITIES DELISTED NATIONAL PRIORITIES LIST DNPL 0 0 1.0000 DEPARTMENT OF DEFENSE SITES DOD 0 0 1.0000 FORMERLY USED DEFENSE SITES FUDS 0 0 1.0000 NO LONGER REGULATED RCRA CORRECTIVE ACTION NLRRCRAC 0 0 1.0000 FACILITIES NATIONAL PRIORITIES LIST NPL 0 0 1.0000 PROPOSED NATIONAL PRIORITIES LIST PNPL 0 0 1.0000 RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE RCRAC 0 0 1.0000 ACTION FACILITIES RECORD OF DECISION SYSTEM RODS 0 0 1.0000 SUB-TOTAL 0 0 STATE (NV) NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM NPDES 0 0 Target Property PERMITS SPILLS LISTING SPILLS 0 0 Target Property ABOVEGROUND STORAGE TANKS AST 0 0 0.2500 REGISTERED UNDERGROUND STORAGE TANKS UST 0 0 0.2500 BROWNFIELD PROPERTIES BF 0 0 0.5000 HAZARDOUS WASTE RECYCLING FACILITIES HWRECYCLERS 0 0 0.5000 LEAKING UNDERGROUND STORAGE TANKS LUST 0 0 0.5000 RECYCLING FACILITIES RECYCLERS 0 0 0.5000 SOLID WASTE FACILITIES SWF 0 1 0.5000 www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DATABASE FINDINGS SUMMARY 2

367 DATABASE FINDINGS SUMMARY SEARCH LOCA- UNLOCA- RADIUS DATABASE ACRONYM TABLE TABLE (miles) TIER I I FACILITY LISTING TIERII 0 0 0.5000 VOLUNTARY CLEANUP PROGRAM SITES VCP 0 0 0.5000 SUB-TOTAL 0 1 TRIBAL UNDERGROUND STORAGE TANKS ON TRIBAL LANDS USTR09 0 0 0.2500 LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS LUSTR09 0 0 0.5000 OPEN DUMP INVENTORY ON TRIBAL LANDS ODINDIAN 0 0 0.5000 INDIAN RESERVATIONS INDIANRES 1 0 1.0000 SUB-TOTAL 1 0 TOTAL 1 1 www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DATABASE FINDINGS SUMMARY 3

368 LOCATABLE DATABASE FINDINGS SEARCH RADIUS Target 1/8 Mile 1/4 Mile 1/2 Mile 1 Mile ACRONYM (miles) Property (> TP) (> 1/8) (> 1/4) (> 1/2) > 1 Mile Total FEDERAL AIRSAFS .0200 0 NS NS NS NS NS 0 BRS .0200 0 NS NS NS NS NS 0 CDL .0200 0 NS NS NS NS NS 0 DOCKETS .0200 0 NS NS NS NS NS 0 EC .0200 0 NS NS NS NS NS 0 ERNSNV .0200 0 NS NS NS NS NS 0 FRSNV .0200 0 NS NS NS NS NS 0 HMIRSR09 .0200 0 NS NS NS NS NS 0 ICIS .0200 0 NS NS NS NS NS 0 ICISNPDES .0200 0 NS NS NS NS NS 0 MLTS .0200 0 NS NS NS NS NS 0 NPDESR09 .0200 0 NS NS NS NS NS 0 PADS .0200 0 NS NS NS NS NS 0 PCSR09 .0200 0 NS NS NS NS NS 0 RCRASC .0200 0 NS NS NS NS NS 0 SFLIENS .0200 0 NS NS NS NS NS 0 SSTS .0200 0 NS NS NS NS NS 0 TRI .0200 0 NS NS NS NS NS 0 TSCA .0200 0 NS NS NS NS NS 0 NLRRCRAG .1250 0 0 NS NS NS NS 0 RCRAGR09 .1250 0 0 NS NS NS NS 0 HISTPST .2500 0 0 0 NS NS NS 0 BF .5000 0 0 0 0 NS NS 0 CERCLIS .5000 0 0 0 0 NS NS 0 LUCIS .5000 0 0 0 0 NS NS 0 NFRAP .5000 0 0 0 0 NS NS 0 NLRRCRAT .5000 0 0 0 0 NS NS 0 www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 LOCATABLE DATABASE FINDINGS 1

369 LOCATABLE DATABASE FINDINGS SEARCH RADIUS Target 1/8 Mile 1/4 Mile 1/2 Mile 1 Mile ACRONYM (miles) Property (> TP) (> 1/8) (> 1/4) (> 1/2) > 1 Mile Total ODI .5000 0 0 0 0 NS NS 0 RCRAT .5000 0 0 0 0 NS NS 0 DNPL 1.000 0 0 0 0 0 NS 0 DOD 1.000 0 0 0 0 0 NS 0 FUDS 1.000 0 0 0 0 0 NS 0 NLRRCRAC 1.000 0 0 0 0 0 NS 0 NPL 1.000 0 0 0 0 0 NS 0 PNPL 1.000 0 0 0 0 0 NS 0 RCRAC 1.000 0 0 0 0 0 NS 0 RODS 1.000 0 0 0 0 0 NS 0 SUB-TOTAL 0 0 0 0 0 0 0 STATE (NV) NPDES .0200 0 NS NS NS NS NS 0 SPILLS .0200 0 NS NS NS NS NS 0 AST .2500 0 0 0 NS NS NS 0 UST .2500 0 0 0 NS NS NS 0 BF .5000 0 0 0 0 NS NS 0 HWRECYCLERS .5000 0 0 0 0 NS NS 0 LUST .5000 0 0 0 0 NS NS 0 RECYCLERS .5000 0 0 0 0 NS NS 0 SWF .5000 0 0 0 0 NS NS 0 TIERII .5000 0 0 0 0 NS NS 0 VCP .5000 0 0 0 0 NS NS 0 SUB-TOTAL 0 0 0 0 0 0 0 TRIBAL USTR09 .2500 0 0 0 NS NS NS 0 www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 LOCATABLE DATABASE FINDINGS 2

370 LOCATABLE DATABASE FINDINGS SEARCH RADIUS Target 1/8 Mile 1/4 Mile 1/2 Mile 1 Mile ACRONYM (miles) Property (> TP) (> 1/8) (> 1/4) (> 1/2) > 1 Mile Total LUSTR09 .5000 0 0 0 0 NS NS 0 ODINDIAN .5000 0 0 0 0 NS NS 0 INDIANRES 1.000 1 0 0 0 0 NS 1 SUB-TOTAL 1 0 0 0 0 0 1 TOTAL 1 0 0 0 0 0 1 NOTES: NS = NOT SEARCHED www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 LOCATABLE DATABASE FINDINGS 3

371 "RADIUS MAP 1 Mile 1/2 Mile 1/4 Mile 1/8 Mile 1 Target Property (TP) Moapa INDIANRES Clark County, Nevada 89406 0' 1500' 3000' 4500' SCALE: 1"" = 3000' www.geo-search.com - phone: 888-396-0042 - fax: 512-472-9967 JOB #: 57765 - 5/21/2013"

372 "RADIUS MAP 1/2 Mile 1/4 Mile 1/8 Mile 1 Target Property (TP) Moapa INDIANRES Clark County, Nevada 89406 0' 1000' 2000' 3000' SCALE: 1"" = 2000' www.geo-search.com - phone: 888-396-0042 - fax: 512-472-9967 JOB #: 57765 - 5/21/2013"

373 "ORTHOPHOTO MAP 1/2 Mile 1/4 Mile 1/8 Mile 1 Target Property (TP) Quadrangle(s): Arrow Canyon INDIANRES Se, Dry Lake Source: USGS (1994 05 2) Moapa Clark County, Nevada 89406 0' 1000' 2000' 3000' SCALE: 1"" = 2000' www.geo-search.com - phone: 888-396-0042 - fax: 512-472-9967 JOB #: 57765 - 5/21/2013"

374 "TOPOGRAPHIC MAP 1 Mile 1/2 Mile 1/4 Mile 1/8 Mile Target Property (TP) Quadrangle(s): Arrow Canyon Se, Dry Lake Source: USGS, 1986 Moapa Clark County, Nevada 89406 0' 1500' 3000' 4500' SCALE: 1"" = 3000' www.geo-search.com - phone: 888-396-0042 - fax: 512-472-9967 JOB #: 57765 - 5/21/2013"

375 REPORT SUMMARY OF LOCATABLE SITES MAP DATABASE DISTANCE PAGE ID# NAME SITE ID# FROM SITE SITE NAME ADDRESS CITY, ZIP CODE # 1 INDIANRES 487 0.001 NE MOAPA RIVER MOAPA BAND OF PAIUTE INDIANS OVERTON, 89040 1 RESERVATION OF THE www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 SUMMARY 1

376 INDIAN RESERVATIONS (INDIANRES) MAP ID# 1 Distance from Property: 0.00 mi.

As this document predominantly consists of tabulated and structured data without conventional narratives, statements, or sentences, there aren't pronouns or entities with typical references like in narrative texts. Therefore, coreference resolution tasks, such as replacing pronouns with corresponding noun phrases, are not applicable in this context. Is there anything else you would like to do with this document?NE SITE INFORMATION ENTITY: MOAPA RIVER RESERVATION OCCUPANT: MOAPA BAND OF PAIUTE INDIANS OF THE MOAPA RIVER INDIAN RESERVATION, CALIFORNIA AIANA DESCRIPTION: AMERICAN INDIAN RESERVATION ENTITY IN FEDERAL REGISTER: YES ACRES: 71675.04 SQUARE MILES: 111.99 www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 1

377 REPORT SUMMARY OF UNLOCATABLE SITES DATABASE SITE SITE TYPE ID# NAME ADDRESS CITY ZIP CODE SWF 1262234730 MOAPA INDIAN RESERVATION OVERTON 89040 www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 1

378 SOLID WASTE FACILITIES (SWF) FACILITY INFORMATION GS ID: 1262234730 FACILITY ID: NOT REPORTED NAME: MOAPA INDIAN RESERVATION ADDRESS: STREET NOT REPORTED OVERTON, NV 89040 COUNTY: CLARK AFFILIATE ADDRESS: NOT REPORTED FACILITY DETAILS FACILITY TYPE: CLASS II FACILITY STATUS: CLOSED www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 1

379 "ENVIRONMENTAL RECORDS DEFINITIONS - FEDERAL AIRSAFS Aerometric Information Retrieval System / Air Facility Subsystem VERSION DATE: 8/2012 The United States Environmental Protection Agency (EPA) modified the Aerometric Information Retrieval System (AIRS) to a database that exclusively tracks the compliance of stationary sources of air pollution with EPA regulations: the Air Facility Subsystem (AFS). Since this change in 2001, the management of the Aerometric Information Retrieval System / Air Facility Subsystem (AFS) database was assigned to EPA's Office of Enforcement and Compliance Assurance. BF Brownfields Management System VERSION DATE: 4/2013 Brownfields are real property, the expansion, redevelopment, or reuse of brownfields may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in brownfields takes development pressures off of undeveloped, open land, and both improves and protects the environment. The United States Environmental Protection Agency maintains this database to track activities in the various brownfield grant programs including grantee assessment, site cleanup and site redevelopment. BRS Biennial Reporting System VERSION DATE: 12/2009 The United States Environmental Protection Agency (EPA), in cooperation with the States, biennially collects information regarding the generation, management, and final disposition of hazardous wastes regulated under the Resource Conservation and Recovery Act of 1976 (RCRA), as amended. The Biennial Report captures detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage and disposal facilities. Currently, the EPA states that data collected between 1991 and 1997 was originally a part of the defunct Biennial Reporting System and is now incorporated into the RCRAInfo data system. CDL Clandestine Drug Laboratory Locations VERSION DATE: 3/2013 The U.S. Department of Justice (""the Department"") provides Clandestine Drug Laboratory Locations as a public service. The Clandestine Drug Laboratory Locations contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee Clandestine Drug Laboratory Locations' accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments. The Department does not establish, implement, enforce, or certify compliance with clean-up or remediation standards for contaminated sites; the public should contact a state or local health department or environmental protection agency for that information. www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DEFINITIONS 1"

380 ENVIRONMENTAL RECORDS DEFINITIONS - FEDERAL CERCLIS Comprehensive Environmental Response, Compensation & Liability Information System VERSION DATE: 12/2012 CERCLIS is the repository for site and non-site specific Superfund information in support of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). This United States Environmental Protection Agency database contains an extract of sites that have been investigated or are in the process of being investigated for potential environmental risk. DNPL Delisted National Priorities List VERSION DATE: 12/2012 This database includes sites from the United States Environmental Protection Agency's Final National Priorities List (NPL) where remedies have proven to be satisfactory or sites where the original analyses were inaccurate, and the site is no longer appropriate for inclusion on the NPL, and final publication in the Federal Register has occurred.DOCKETS EPA Docket Data VERSION DATE: 12/2005 The United States Environmental Protection Agency Docket data lists Civil Case Defendants, filing dates as far back as 1971, laws broken including section, violations that occurred, pollutants involved, penalties assessed and superfund awards by facility and location. Please refer to the Integrated Compliance Information System database as the source of current data. DOD Department of Defense Sites VERSION DATE: 12/2005 The information originates from the National Atlas of the United States Federal Lands data, which includes lands owned or administered by the Federal government. Army Department of Defense, Army Corps of Engineers Department of Defense, Air Force Department of Defense, Navy Department of Defense and Marine Department of Defense areas of 640 acres or more are included. EC Federal Engineering Institutional Control Sites VERSION DATE: 4/2013 The database includes site locations where Engineering and/or Institutional Controls have been identified as part of a selected remedy for the site as defined by United States Environmental Protection Agency official remedy decision documents. A site listing does not indicate that the institutional and engineering controls are currently in place nor will the institutional and engineering controls be in place once the remedy is complete; a site listing only indicates that the decision to include either of the controls in the remedy is documented as of the completed date of the document. Institutional controls are actions, such as legal controls, that help minimize the potential for human exposure to contamination by ensuring appropriate land or resource use. Engineering controls include caps, barriers, or other devices engineered to prevent access, exposure, or continued migration of contamination. www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DEFINITIONS 2 381 ENVIRONMENTAL RECORDS DEFINITIONS - FEDERAL ERNSNV Emergency Response Notification System VERSION DATE: 12/2012 The National Response Center database contains data on reported releases of oil, chemical, radiological, biological, and/or etiological discharges into the environment anywhere in the United States and United States territories. The data comes from spill reports made to the U.S. Environmental Protection Agency, U.S. Coast Guard, the National Response Center and/or the U.S. Department of Transportation. FRSNV Facility Registry System VERSION DATE: 11/2012 The United States Environmental Protection Agency's Office of Environmental Information developed the Facility Registry System as the centrally managed database that identifies facilities, sites or places subject to environmental regulations or of environmental interest. The Facility Registry System replaced the Facility Index System or FINDS database. FUDS Formerly Used Defense Sites VERSION DATE: 2/2013 The 2011 Formerly Used Defense Sites inventory includes properties previously owned by or leased to the United States and under Secretary of Defense jurisdiction. The remediation of the properties is the responsibility of the Department of Defense. HISTPST Historical Gas Stations VERSION DATE: 7/1930 The historic directory of service stations is provided by the Cities Service Company. The directory includes Cities Service filling stations that were located throughout the United States in 1930. HMIRSR09 Hazardous Materials Incident Reporting System VERSION DATE: 1/2013 The Hazardous Materials Incident Reporting System database contains unintentional hazardous materials release information reported to the U.S. Department of Transportation located in Environmental Protection Agency Region 9. Environmental Protection Agency Region 9 includes the following states: Arizona, California, Hawaii, Nevada, and the territories of Guam and American Samoa. Integrated Compliance Information System Integrated Compliance Information System (formerly DOCKETS) VERSION DATE: 8/2012 Integrated Compliance Information System is a case activity tracking and management system for civil, judicial, and administrative federal Environmental Protection Agency enforcement cases. Integrated Compliance Information System contains information on federal administrative and federal judicial cases under the following environmental statutes: the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Emergency Planning and Community Right-to-Know Act - Section 313, the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Safe Drinking Water Act, and the Marine Protection, Research, and Sanctuaries Act. Integrated Compliance Information System National Pollutant Discharge Elimination System Integrated Compliance Information System National Pollutant Discharge Elimination System VERSION DATE: 8/2012 In 2006, the Integrated Compliance Information System - National Pollutant Discharge Elimination System became the National Pollutant Discharge Elimination System national system of record for select states, tribes and territories. Integrated Compliance Information System National Pollutant Discharge Elimination System is an information management system maintained by the United States Environmental Protection Agency's Office of Compliance to track permit compliance and enforcement status of facilities regulated by the National Pollutant Discharge Elimination System under the Clean Water Act. Integrated Compliance Information System National Pollutant Discharge Elimination System is designed to support the National Pollutant Discharge Elimination System program at the state, regional, and national levels.LUCIS Land Use Control Information System VERSION DATE: 9/2006 The LUCIS database is maintained by the U.S. Navy and contains information for former Base Realignment and Closure (BRAC) properties across the United States. MLTS Material Licensing Tracking System VERSION DATE: 1/2013 The MLTS is a list of approximately 8,100 sites which have or use radioactive materials subject to the United States Nuclear Regulatory Commission (NRC) licensing requirements. NFRAP No Further Remedial Action Planned Sites VERSION DATE: 12/2012 The NFRAP database includes sites which have been determined by the United States Environmental Protection Agency, following preliminary assessment, to no longer pose a significant risk or require further activity under CERCLA. After initial investigation, no contamination was found, contamination was quickly removed or contamination was not serious enough to require Federal Superfund action or NPL consideration. NLRRCRAC No Longer Regulated RCRA Corrective Action Facilities VERSION DATE: 3/2013 The NLRRCRAC database includes RCRA Corrective Action facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements. www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DEFINITIONS 4 ENVIRONMENTAL RECORDS DEFINITIONS - FEDERAL NLRRCRAG No Longer Regulated RCRA Generator Facilities VERSION DATE: 3/2013 The NLRRCRAG database includes RCRA Generator facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements. The NLRRCRAG listing includes facilities that formerly generated hazardous waste. Large Quantity Generators: Generate 1,000 kg or more of hazardous waste during any calendar month; or Generate more than 1 kg of acutely hazardous waste during any calendar month; or Generate more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month; or Generate 1 kg or less of acutely hazardous waste during any calendar month, and accumulate more than 1 kg of acutely hazardous waste at any time; or Generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulated more than 100 kg of that material at any time. Small Quantity Generators: Generate more than 100 and less than 1000 kilograms of hazardous waste during any calendar month and accumulate less than 6000 kg of hazardous waste at any time; or Generate 100 kg or less of hazardous waste during any calendar month, and accumulate more than 1000 kg of hazardous waste at any time. Conditionally Exempt Small Quantity Generators: Generate 100 kilograms or less of hazardous waste per calendar month, and accumulate 1000 kg or less of hazardous waste at any time; or Generate one kilogram or less of acutely hazardous waste per calendar month, and accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or Generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month, and accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste. NLRRCRAT No Longer Regulated RCRA Non-CORRACTS TSD Facilities VERSION DATE: 3/2013 The NLRRCRAT database includes RCRA Non-Corrective Action TSD facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements. The NLRRCRAT listing includes facilities that formerly treated, stored or disposed of hazardous waste. NPDESR09 National Pollutant Discharge Elimination System VERSION DATE: 4/2007 Information in the NPDESR09 database is extracted from the Water Permit Compliance System (PCS) database which is used by United States Environmental Protection Agency to track surface water permits issued under the Clean Water Act. The NPDESR09 database includes permitted facilities located in www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DEFINITIONS 5 "ENVIRONMENTAL RECORDS DEFINITIONS - FEDERAL EPA Region 9. EPA Region 9 includes the following states: Arizona, California, Hawaii, Nevada, and the territories of Guam and American Samoa.The NPDES database was collected from December 2002 until April 2007. Refer to the PCS and/or ICIS-NPDES database as source of current data. NPL National Priorities List VERSION DATE: 12/2012 This database includes United States Environmental Protection Agency (EPA) National Priorities List sites that fall under the EPA's Superfund program, established to fund the cleanup of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action. ODI Open Dump Inventory VERSION DATE: 6/1985 The open dump inventory was published by the United States Environmental Protection Agency. An "open dump" is defined as a facility or site where solid waste is disposed of which is not a sanitary landfill which meets the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944) and which is not a facility for disposal of hazardous waste. The open dump inventory has not been updated since June 1985. PADS PCB Activity Database System VERSION DATE: 11/2012 The PCB Activity Database System (PADS) is used by the United States Environmental Protection Agency to monitor the activities of polychlorinated biphenyls (PCB) handlers. PCSR09 Permit Compliance System VERSION DATE: 8/2012 The Permit Compliance System is used in tracking enforcement status and permit compliance of facilities controlled by the National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act and is maintained by the United States Environmental Protection Agency's Office of Compliance. The Permit Compliance System is designed to support the NPDES program at the state, regional, and national levels. The PCSR09 database includes permitted facilities located in EPA Region 9. EPA Region 9 includes the following states: Arizona, California, Hawaii, Nevada, and the territories of Guam and American Samoa. PNPL Proposed National Priorities List VERSION DATE: 12/2012 The PNPL database contains sites proposed to be included on the National Priorities List (NPL) in the Federal Register. The United States Environmental Protection Agency investigates these sites to www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DEFINITIONS 6" 385 ENVIRONMENTAL RECORDS DEFINITIONS - FEDERAL determine if these sites may present long-term threats to public health or the environment. RCRAC Resource Conservation & Recovery Act - Corrective Action Facilities VERSION DATE: 3/2013 The RCRAC database includes hazardous waste sites listed with corrective action activity in the RCRAInfo system. The Corrective Action Program requires owners or operators of Resource Conservation and Recovery Act facilities (or treatment, storage, and disposal facilities) to investigate and cleanup contamination in order to protect human health and the environment. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The RCRAInfo system replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). RCRAGR09 Resource Conservation & Recovery Act - Generator Facilities VERSION DATE: 3/2013 The RCRAGR09 database includes sites listed as generators of hazardous waste (large, small, and exempt) in the RCRAInfo system. The United States Environmental Protection Agency defines the RCRAInfo system as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The RCRAInfo system replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). The RCRAGR09 database includes sites located in EPA Region 9. EPA Region 9 includes the following states: Arizona, California, Hawaii, Nevada, and the territories of Guam and American Samoa. Large Quantity Generators: Generate 1,000 kg or more of hazardous waste during any calendar month; or Generate more than 1 kg of acutely hazardous waste during any calendar month; or Generate more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month; or Generate 1 kg or less of acutely hazardous waste during any calendar month, and accumulate more than 1kg of acutely hazardous waste at any time; or Generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulated more than 100 kg of that material at any time.Small Quantity Generators: Generate more than 100 and less than 1000 kilograms of hazardous waste during any calendar month and accumulate less than 6000 kg of hazardous waste at any time; or small quantity generators generate 100 kg or less of hazardous waste during any calendar month, and accumulate more than 1000 kg of hazardous waste at any time. Conditionally Exempt Small Quantity Generators: Conditionally Exempt Small Quantity Generators generate 100 kilograms or less of hazardous waste per calendar month, and conditionally exempt small quantity generators accumulate 1000 kg or less of hazardous waste at any time; or Conditionally Exempt Small Quantity Generators generate one kilogram or less of acutely hazardous waste per calendar month, and Conditionally Exempt Small Quantity Generators accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DEFINITIONS 7 "ENVIRONMENTAL RECORDS DEFINITIONS - FEDERAL acutely hazardous waste; or Conditionally Exempt Small Quantity Generators generate 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, or acutely hazardous waste during any calendar month, and Conditionally Exempt Small Quantity Generators accumulate at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste. RCRASC RCRA Sites with Controls VERSION DATE: 6/2012 This list of Resource Conservation and Recovery Act sites with institutional controls in place is provided by the U.S. Environmental Protection Agency. RCRAT Resource Conservation & Recovery Act - Treatment, Storage & Disposal Facilities VERSION DATE: 3/2013 This database includes Non-Corrective Action sites listed as treatment, storage and/or disposal facilities of hazardous waste in the RCRAInfo system. The United States Environmental Protection Agency defines RCRAInfo as the comprehensive information system which provides access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS) and the Biennial Reporting System (BRS). RODS Record of Decision System VERSION DATE: 1/2013 These decision documents maintained by the United States Environmental Protection Agency describe the chosen remedy for NPL (Superfund) site remediation. These decision documents also include site history, site description, site characteristics, community participation, enforcement activities, past and present activities, contaminated media, the contaminants present, and scope and role of response action. SFLIENS CERCLIS Liens VERSION DATE: 6/2012 A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which the United States Environmental Protection Agency has spent Superfund monies. These Superfund monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties. This CERCLIS database contains those CERCLIS sites where the Lien on Property action is complete. www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DEFINITIONS 8 "ENVIRONMENTAL RECORDS DEFINITIONS - FEDERAL SSTS Section Seven Tracking System VERSION DATE: 12/2009 The United States Environmental Protection Agency tracks information on pesticide establishments through the Section Seven Tracking System (SSTS). The Section Seven Tracking System records the registration of new establishments and records pesticide production at each establishment. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requires that production of pesticides or devices be conducted in a registered pesticide-producing or device-producing establishment. ("Production" includes formulation, packaging, repackaging, and relabeling.) TRI Toxics Release Inventory VERSION DATE: 12/2011 The Toxics Release Inventory, provided by the United States Environmental Protection Agency, includes data on toxic chemical releases and waste management activities from certain industries as well as federal facilities. The Toxics Release Inventory contains information about the types and amounts of toxic chemicals that are released each year to the air, water, and land as well as information on the quantities of toxic chemicals sent to other facilities for further waste management. TSCA Toxic Substance Control Act Inventory VERSION DATE: 12/2006 The Toxic Substances Control Act (TSCA) was enacted in 1976 to ensure that chemicals manufactured, imported, processed, or distributed in commerce, or used or disposed of in the United States do not pose any unreasonable risks to human health or the environment.TSCA section 8(b) provides the United States Environmental Protection Agency authority to "compile, keep current, and publish a list of each chemical substance that is manufactured or processed in the United States." The TSCA Chemical Substance Inventory contains non-confidential information on the production amount of toxic chemicals from each manufacturer and importer site. www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DEFINITIONS 9

ENVIRONMENTAL RECORDS DEFINITIONS - STATE (NV) AST Aboveground Storage Tanks VERSION DATE: 6/2008 This listing of aboveground storage tanks was provided by the Nevada State Emergency Response Commission (SERC). In January of 2009, the Nevada State Emergency Response Commission discontinued the sharing of facility-specific information due to the U.S. Environmental Protection Agency's Office of General Counsel and a Nevada Attorney General's guidance relating to the Emergency Planning and Community Right-to-Know Act (EPCRA). According to the Nevada State Emergency Response Commission, AAI requirements do not fall under the EPCRA program and the Nevada State Emergency Response Commission does not and never has "regulated" ASTs. For these reasons, companies such as GeoSearch are unable to obtain current aboveground storage tank information. Please contact the Nevada State Emergency Response Commission at (775) 687-6973 if you require information regarding the Emergency Planning and Community Right-to-Know Act reporting requirements of a specific facility within the State of Nevada. BF Brownfield Properties VERSION DATE: 1/2012 This listing of brownfield properties is maintained by the Nevada Division of Environmental Protection (NDEP). The Nevada Division of Environmental Protection describes brownfields as abandoned, idled, or underused industrial or commercial properties taken out of productive use because of real or perceived risks from environmental contamination. The State of Nevada has initiated Brownfields, a land-recycling program, to provide an opportunity to redevelop these undesirable properties and revitalize communities. HWRECYCLERS Hazardous Waste Recycling Facilities VERSION DATE: 1/2011 This listing of hazardous waste recycling facilities is maintained by the Nevada Division of Environmental Protection's Bureau of Waste Management. Nevada Administrative Code (NAC) 444.84555 requires a facility or mobile unit for the recycling of hazardous waste to obtain a Written Determination by the Nevada Division of Environmental Protection Administrator. LUST Leaking Underground Storage Tanks VERSION DATE: 1/2013 This database includes both Leaking Underground Storage Tank (LUST) cases as well as Corrective Action (non-regulated) sites and is maintained by the Nevada Division of Environmental Protection's Bureau of Corrective Actions. NPDES National Pollutant Discharge Elimination System Permits VERSION DATE: 1/2013 The listing of active NPDES Permits is maintained by the Nevada Division of Environmental Protection's Bureau of Water Pollution Control (BWPC). The Bureau of Water Pollution Control issues National Pollutant Discharge Elimination System (NPDES) Permits for discharge to surface waters, ground water www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DEFINITIONS 10

ENVIRONMENTAL RECORDS DEFINITIONS - STATE (NV) permits for discharges that may impact subsurface waters, Underground Injection Control (UIC) permits for injection through wells, and Stormwater Permits. RECYCLERS Recycling Facilities VERSION DATE: NR The recycling facilities included in this database are compiled from various city and county listings created between 2011 and 2012, and are provided by the Nevada Division of Environmental Protection. SPILLS Spills Listing VERSION DATE: 1/2013 The Nevada Division of Environmental Protection defines a release as any pollutant, hazardous waste or contaminant that has been spilled, leaked, pumped, poured, emitted, emptied, discharged, injected, escaped, leached, dumped or disposed into the environment. A spill of any quantity that affects a waterway within the State of Nevada must be reported, regardless of the quantity. SWF Solid Waste Facilities VERSION DATE: 1/2012 The inventory of open and closed solid waste disposal facilities is maintained by the Nevada Division of Environmental Protection's Bureau of Waste Management. TIERII Tier II Facility Listing VERSION DATE: 6/2008 The Nevada State Emergency Response Commission provided this listing of Tier II facilities which store hazardous chemicals or materials on-site. The OSHA Hazard Communication Standard defines hazardous chemicals as any substance for which a facility must maintain a Material Safety Data Sheet (MSDS). In January of 2009, the Nevada State Emergency Response Commission discontinued the sharing of facility-specific information due to the U.S. Environmental Protection Agency's Office of General Counsel and a Nevada Attorney General's guidance relating to the Emergency Planning and Community Right-to-Know Act (EPCRA). For this reason, companies such as GeoSearch are unable to obtain current TIER II facility information.Please contact the State Emergency Response Commission (SERC) at (775) 687-6973 if you require information regarding the Emergency Planning and Community Right-to-Know Act (EPCRA) reporting requirements of a specific facility within the State of Nevada. The listing of registered underground and aboveground storage tanks is maintained by the Nevada Division of Environmental Protection's Bureau of Corrective Actions. www.geo-search.com phone: 888-396-0042 fax: 512-472-9967

DEFINITIONS 11 - ENVIRONMENTAL RECORDS DEFINITIONS - STATE (NV)

Voluntary Cleanup Program (VCP) Sites VERSION DATE: 8/2011 The Voluntary Cleanup Program (VCP) provides relief from liability to owners who undertake cleanups of contaminated properties under the oversight of the Nevada Division of Environmental Protection's Bureau of Corrective Actions. www.geo-search.com phone: 888-396-0042 fax: 512-472-9967

DEFINITIONS 12 - ENVIRONMENTAL RECORDS DEFINITIONS - TRIBAL

The Department of Interior and Bureau of Indian Affairs maintains this database that includes American Indian Reservations, off-reservation trust lands, public domain allotments, Alaska Native Regional Corporations and Recognized State Reservations. The Leaking Underground Storage Tanks on Tribal Lands database, provided by the United States Environmental Protection Agency (EPA), contains leaking underground storage tanks on Tribal lands located in EPA Region 9. This EPA Region 9 includes the following states: Arizona, California, Hawaii, Nevada, and the territories of Guam and American Samoa. The Open Dump Inventory on Tribal Lands database, maintained by the Indian Health Service, contains information about facilities and sites on tribal lands where solid waste is disposed of, which are not sanitary landfills or hazardous waste disposal facilities, and which meet the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944). The Underground Storage Tanks on Tribal Lands database, also provided by the United States Environmental Protection Agency (EPA), contains underground storage tanks on Tribal lands located in EPA Region 9. This region includes the following states: Arizona, California, Hawaii, Nevada, and the territories of Guam and American Samoa.www.geo-search.com phone: 888-396-0042 fax: 512-472-9967 DEFINITIONS 13 392 Appendix L Air Emission Calculations 393 Summary of PV Construction Emissions 2014 Construction Emissions NOx CO SO2 VOC PM10 PM2.5 CO2 N2O CH4 CO2e TOTAL HAP Construction Emission Category (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) (metric tons) (tons) Construction Equipment Exhaust 5.53 3.35 0.01 0.74 0.57 0.57 - - - - - On-Road Vehicle Exhaust - Heavy Duty Vehicles 3.22 1.27 0.00 0.16 0.19 0.17 455.29 0.00 0.01 413.37 0.03 On-Road Vehicle Exhaust - Commute Vehicles 3.01 13.21 0.03 0.58 0.21 0.12 1709.90 0.02 0.03 1556.94 0.17 Fugitive Dust from Travel on Paved Roads - - - - 5.39 1.32 - - - - - Fugitive Dust from Travel on Unpaved Roads - - - - 2.79 0.28 - - - - - Fugitive Dust from Construction Activities - - - - 11.15 2.32 - - - - - Total 11.77 17.83 0.04 1.48 20.31 4.78 2165.19 0.02 0.04 1970.31 0.20 2015 Construction Emissions NOx CO SO2 VOC PM10 PM2.5 CO2 N2O CH4 CO2e TOTAL HAP Construction Emission Category (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) (metric tons) (tons) Construction Equipment Exhaust 9.74 5.86 0.01 1.34 0.97 0.97 - - - - - On-Road Vehicle Exhaust - Heavy Duty Vehicles 5.91 2.36 0.01 0.30 0.36 0.31 907.17 0.00 0.02 823.64 0.06 On-Road Vehicle Exhaust - Commute Vehicles 5.43 24.54 0.06 1.03 0.41 0.23 3357.99 0.03 0.06 3056.64 0.31 Fugitive Dust from Travel on Paved Roads - - - - 10.74 2.64 - - - - - Fugitive Dust from Travel on Unpaved Roads - - - - 5.57 0.56 - - - - - Fugitive Dust from Construction Activities - - - - 0.10 0.02 - - - - - Total 21.08 32.76 0.08 2.67 18.15 4.73 4265.16 0.04 0.08 3880.28 0.36 394 Moapa Solar PV Construction - Construction Equipment Exhaust Expected Construction Start 7/1/2014 Expected Construction End 12/31/2015 2014 Construction Duration 131 days Mon-Fri 12 hours/day 2015 Construction Duration 261 days Mon-Fri 12 hours/day Horsepower Duration Duration 2014 Construction Equipment Emission Factors (g/hp-hr) 2014 Construction Equipment Emissions (tons) Model Equipment Types Fuel Type Number (hp) (days) (hours) NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 Aerial Lifts Diesel 50 1 131 1,572 5.77 6.78 0.005 1.776 0.968 0.968 0.500 0.588 0.000 0.154 0.084 0.084 Concrete/Industrial Saws Diesel 50 1 131 1,572 4.25 1.48 0.004 0.253 0.246 0.246 0.369 0.128 0.000 0.022 0.021 0.021 Cranes Diesel 175 1 131 1,572 2.86 0.727 0.003 0.227 0.174 0.174 0.868 0.220 0.001 0.069 0.053 0.053 Dumpers/Tenders Diesel 50 1 131 1,572 5.58 6.13 0.005 1.528 0.922 0.922 0.484 0.531 0.000 0.132 0.080 0.080 Excavators Diesel 175 2 131 1,572 2.19 0.949 0.003 0.187 0.229 0.229 1.329 0.575 0.002 0.114 0.139 0.139 Off-Highway Trucks Diesel 300 1 131 1,572 1.53 0.444 0.003 0.151 0.082 0.082 0.798 0.231 0.001 0.078 0.042 0.042 Rough Terrain Forklifts Diesel 75 1 131 1,572 3.90 2.82 0.004 0.316 0.340 0.340 0.506 0.366 0.000 0.041 0.044 0.044 Tractors/Loaders/Backhoes Diesel 75 1 131 1,572 5.21 5.44 0.005 0.967 0.797 0.797 0.678 0.707 0.001 0.126 0.104 0.104 Total 5.53 3.35 0.007 0.736 0.567 0.567 Horsepower Duration Duration 2015 Construction Equipment Emission Factors (g/hp-hr) 2015 Construction Equipment Emissions (tons) Model Equipment Types Fuel Type Number (hp) (days) (hours) NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 Aerial Lifts Diesel 50 1 261 3,132 5.59 6.32 0.004 1.643 0.907 0.907 0.966 1.090 0.001 0.284 0.157 0.157 Concrete/Industrial Saws Diesel 50 1 261 3,132 4.05 1.23 0.004 0.230 0.197 0.197 0.700 0.212 0.001 0.040 0.034 0.034 Cranes Diesel 175 1 261 3,132 2.48 0.647 0.003 0.209 0.156 0.156 1.501 0.391 0.002 0.126 0.094 0.094 Dumpers/Tenders Diesel 50 1 261 3,132 5.38 5.59 0.004 1.379 0.849 0.849 0.929 0.965 0.001 0.238 0.146 0.146 Excavators Diesel 175 2 261 3,132 1.82 0.797 0.003 0.174 0.192 0.192 2.204 0.963 0.004 0.210 0.232 0.232 Off-Highway Trucks Diesel 300 1 261 3,132 1.13 0.274 0.003 0.141 0.045 0.045 1.175 0.284 0.003 0.146 0.046 0.046 Rough Terrain Forklifts Diesel 75 1 261 3,132 3.73 2.54 0.004 0.284 0.294 0.294 0.967 0.656 0.001 0.074 0.076 0.076 Tractors/Loaders/Backhoes Diesel 75 1 261 3,132 5.00 5.03 0.004 0.879 0.728 0.728 1.294 1.302 0.001 0.228 0.189 0.189 Total 9.74 5.86 0.013 1.345 0.974 0.974 Notes: 1 - Per the Project, construction of the SPGF, from site preparation and grading to commercial operation, will be expected to take 18 months (mid-2014-end 2015).Construction will generally occur between 7 a.m. and 7 p.m., Monday through Friday. Construction equipment emission factors developed using the EPA NONROAD model. Construction equipment number, type, and HP rating was assumed: A mid-range HP value was chosen for each equipment category.395 Moapa Solar PV Construction - On-Road Vehicle Exhaust - Heavy Duty Vehicles Expected Construction Start 7/1/2014 Expected Construction End 12/31/2015 2014 Construction Duration 131 days 2015 Construction Duration 261 days 2014 Heavy Duty Vehicle Emission Factors (g/mi) 2014 Heavy Duty Vehicle Emissions (tons) Max Daily Max Daily Offsite Onsite Maximum Roundtrip Roundtrip Duration Heavy Duty Vehicle Details Quantity per Distance per NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 Distance per (days) day Vehicle within Vehicle general area (miles/day) (miles/day) Concrete Delivery Truck for General 2 80 0 131 12.6 4.96 0.01 0.62 0.75 0.66 0.290 0.114 0.000 0.014 0.017 0.015 Construction Dump Truck 1 0 7.5 131 12.6 4.96 0.01 0.62 0.75 0.66 0.014 0.005 0.000 0.001 0.001 0.001 Flatbed Truck 5 0 7.5 131 12.6 4.96 0.01 0.62 0.75 0.66 0.068 0.027 0.000 0.003 0.004 0.004 Staff & Security Truck 4 0 7.5 131 12.6 4.96 0.01 0.62 0.75 0.66 0.054 0.021 0.000 0.003 0.003 0.003 Pickup Truck 10 0 7.5 131 12.6 4.96 0.01 0.62 0.75 0.66 0.136 0.054 0.000 0.007 0.008 0.007 Road Preparation Materials Truck 10 15 0 131 12.6 4.96 0.01 0.62 0.75 0.66 0.272 0.107 0.000 0.014 0.016 0.014 General Materials Delivery Truck for General 1 100 0 131 12.6 4.96 0.01 0.62 0.75 0.66 0.182 0.072 0.000 0.009 0.011 0.009 Construction PV Module, Tracker, & Electrical component 12 100 0 131 12.6 4.96 0.01 0.62 0.75 0.66 2.178 0.859 0.002 0.108 0.131 0.114 Delivery Water Delivery Truck 2 0 7.5 131 12.6 4.96 0.01 0.62 0.75 0.66 0.027 0.011 0.000 0.001 0.002 0.001 Total 3.222 1.270 0.004 0.160 0.193 0.168 2014 Heavy Duty Vehicle 2014 Heavy Duty Vehicle Emissions (tons) Emission Factors (g/mi) Max Daily Max Daily Offsite Onsite Maximum Roundtrip CO2e Roundtrip Duration Heavy Duty Vehicle Details Quantity per Distance per CO2 N2O CH4 CO2 N2O CH4 (metric Distance per (days) day Vehicle within tons) Vehicle general area (miles/day) (miles/day) Concrete Delivery Truck for General 2 80 0 131 1776.3 0.004 0.03 41.040 0.000 0.001 Construction 37.26 Dump Truck 1 0 7.5 131 1776.3 0.004 0.03 1.924 0.000 0.000 1.75 Flatbed Truck 5 0 7.5 131 1776.3 0.004 0.03 9.619 0.000 0.000 8.73 Staff & Security Truck 4 0 7.5 131 1776.3 0.004 0.03 7.695 0.000 0.000 6.99 Pickup Truck 10 0 7.5 131 1776.3 0.004 0.03 19.238 0.000 0.000 17.47 Road Preparation Materials Truck 10 15 0 131 1776.3 0.004 0.03 38.475 0.000 0.001 34.93 General Materials Delivery Truck for General 1 100 0 131 1776.3 0.004 0.03 25.650 0.000 0.000 Construction 23.29 PV Module, Tracker, & Electrical component 12 100 0 131 1776.3 0.004 0.03 307.801 0.001 0.005 Delivery 279.46 Water Delivery Truck 2 0 7.5 131 1776.3 0.004 0.03 3.848 0.000 0.000 3.49 Total 455.290 0.001 0.008 413.368

396 Moapa Solar PV Construction - On-Road Vehicle Exhaust - Heavy Duty Vehicles - Continued 2014 Heavy Duty Vehicle Emission Factors (g/mi) Max Daily Offsite Max Daily Roundtrip Onsite Distance Maximu Roundtrip per 1,3- Form- Acet- 2,2,4- Ethyl Propion- PAH (less Heavy Duty Vehicle m Distance Duratio Benzen Ethano MTB Acrolei Hexan Styren Toluen Xylen Naphthalen Vehicle e l E Butadien aldehyd aldehyd n Trimethyl Benzen e aldehyd e e e e Naphthalene Details Quantity per n (days) e e e -pentane e e ) within per day Vehicle general (miles/day area ) (miles/day ) Concrete Delivery Truck for 2 80 0 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 General Construction Dump Truck 1 0 7.5 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Flatbed Truck 5 0 7.5 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Staff & Security Truck 4 0 7.5 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Pickup Truck 10 0 7.5 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Road Preparation Materials 10 15 0 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Truck General Materials Delivery Truck for General 1 100 0 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Construction PV Module, Tracker, & Electrical component 12 100 0 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Delivery Water Delivery Truck 2 0 7.5 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 2014 Heavy Duty Vehicle Emissions (tons) 1,3- Form- Acet- 2,2,4- Ethyl Propion- PAH (less Heavy Duty Vehicle Benzen Ethano MTB Acrolei Hexan Styren Toluen Xylen Naphthalen Total Butadien aldehyd aldehyd Trimethyl Benzen aldehyd Naphthalene Details e l E n e e e e e HAPs e e e -pentane e e ) Concrete Delivery Truck for 0.00 0.000 0.000 0.000 0.000 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 General Construction 3 0.00 Dump Truck 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 0.000 0 0.00 Flatbed Truck 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 0.000 1 0.00 Staff & Security Truck 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 0.000 1 0.00 Pickup Truck 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 0.000 1 Road Preparation Materials 0.00 0.000 0.000 0.000 0.000 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Truck 3 General Materials Delivery 0.00 Truck for General 0.000 0.000 0.000 0.000 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 2 Construction PV Module, Tracker, & 0.02 Electrical component 0.001 0.000 0.000 0.000 0.008 0.004 0.001 0.000 0.001 0.000 0.000 0.000 0.002 0.001 0.001 0.001 1 Delivery 0.00 Water Delivery Truck 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 0.000 0 0.03 Total 0.002 0.001 0.000 0.001 0.012 0.005 0.001 0.001 0.001 0.001 0.001 0.000 0.003 0.002 0.001 0.001 1

397 Moapa Solar PV Construction - On-Road Vehicle Exhaust - Heavy Duty Vehicles - Continued 2015 Heavy Duty Vehicle Emission Factors (g/mi) 2015 Heavy Duty Vehicle Emissions (tons) Maximum Max Daily Offsite Roundtrip Max Daily Onsite Roundtrip Duration Heavy Duty Vehicle Details Quantity per Distance per Vehicle within general Distance per Vehicle NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 (days) day area (miles/day) (miles/day) Concrete Delivery Truck for General 2 80 0 261 11.57 4.61 0.01 0.58 0.70 0.602 0.533 0.212 0.001 0.027 0.032 0.028 Construction Dump Truck 1 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.025 0.010 0.000 0.001 0.002 0.001 Flatbed Truck 5 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.125 0.050 0.000 0.006 0.008 0.006 Staff & Security Truck 4 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.100 0.040 0.000 0.005 0.006 0.005 Pickup Truck 10 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.250 0.100 0.000 0.012 0.015 0.013 Road Preparation Materials Truck 10 15 0 261 11.57 4.61 0.01 0.58 0.70 0.602 0.499 0.199 0.001 0.025 0.030 0.026 General Materials Delivery Truck for 1 100 0 261 11.57 4.61 0.01 0.58 0.70 0.602 0.333 0.133 0.000 0.017 0.020 0.017 General Construction PV Module, Tracker, & Electrical 12 100 0 261 11.57 4.61 0.01 0.58 0.70 0.602 3.996 1.593 0.005 0.200 0.241 0.208 component Delivery Water Delivery Truck 2 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.050 0.020 0.000 0.002 0.003 0.003 Total 5.911 2.356 0.007 0.295 0.356 0.308 2015 Heavy Duty Vehicle 2015 Heavy Duty Vehicle Emissions Emission Factors (g/mi) (tons) Maximum Max Daily Offsite Roundtrip Max Daily Onsite Roundtrip CO2e Duration Heavy Duty Vehicle Details Quantity per Distance per Vehicle within general Distance per Vehicle CO2 N2O CH4 CO2 N2O CH4 (metric (days) day area (miles/day) (miles/day) tons) Concrete Delivery Truck for General 2 80 0 261 1776.44 0.003 0.03 81.773 0.000 0.002 Construction 74.24 Dump Truck 1 0 7.5 261 1776.44 0.003 0.03 3.833 0.000 0.000 3.48 Flatbed Truck 5 0 7.5 261 1776.44 0.003 0.03 19.165 0.000 0.000 17.40 Staff & Security Truck 4 0 7.5 261 1776.44 0.003 0.03 15.332 0.000 0.000 13.92 Pickup Truck 10 0 7.5 261 1776.44 0.003 0.03 38.331 0.000 0.001 34.80 Road Preparation Materials Truck 10 15 0 261 1776.44 0.003 0.03 76.662 0.000 0.001 69.60 General Materials Delivery Truck for 1 100 0 261 1776.44 0.003 0.03 51.108 0.000 0.001 General Construction 46.40 PV Module, Tracker, & Electrical 12 100 0 261 1776.44 0.003 0.03 613.295 0.001 0.011 component Delivery 556.83 Water Delivery Truck 2 0 7.5 261 1776.44 0.003 0.03 7.666 0.000 0.000 6.96 Total 907.165 0.002 0.017 823.642

398 Moapa Solar PV Construction - On-Road Vehicle Exhaust - Heavy Duty Vehicles - Continued 2015 Heavy Duty Vehicle Emission Factors (g/mi) Max Daily Offsite Max Daily Roundtrip Onsite Distance Maximu Roundtrip Propion per Duratio 1,3- Form- Acet- 2,2,4- Ethyl PAH (less m Distance Benzen Ethano MTB Acrolei Hexan - Styren Toluen Xylen Naphthalen Heavy Duty Vehicle Details Vehicle n e l E Butadien aldehyd aldehyd n Trimethy Benzen e aldehyd e e e e Naphthalen Quantity per e e e l-pentane e e) within (days) e per day Vehicle general (miles/da area y) (miles/da y) Concrete Delivery Truck for General 0.00 2 80 0 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 Construction 0 0.00 Dump Truck 1 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 0.00 Flatbed Truck 5 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 0.00 Staff & Security Truck 4 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 0.00 Pickup Truck 10 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 0.00 Road Preparation Materials Truck 10 15 0 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 General Materials Delivery Truck for 0.00 1 100 0 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 General Construction 0 PV Module, Tracker, & Electrical 0.00 12 100 0 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 component Delivery 0 0.00 Water Delivery Truck 2 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 2015 Heavy Duty Vehicle Emissions (tons) Propion 1,3- Form- Acet- 2,2,4- Ethyl PAH (less Total Benzen Ethano MTB Acrolei Hexan - Styren Toluen Xylen Naphthalen Heavy Duty Vehicle Details e l E Butadien aldehyd aldehyd n Trimethy Benzen e aldehyd e e e e Naphthalen HAP e e e l-pentane e e) s e Concrete Delivery Truck for General 0.00 0.00 0.000 0.000 0.000 0.002 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Construction 0 5 0.00 0.00 Dump Truck 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 0 0 0.00 0.00 Flatbed Truck 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 0 1 0.00 0.00 Staff & Security Truck 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 0 1 0.00 0.00 Pickup Truck 0.000 0.000 0.000 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0 2 0.00 0.00 Road Preparation Materials Truck 0.000 0.000 0.000 0.002 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0 5 General Materials Delivery Truck for 0.00 0.00 0.000 0.000 0.000 0.001 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 General Construction 0 3 PV Module, Tracker, & Electrical 0.00 0.03 0.002 0.001 0.001 0.015 0.007 0.001 0.001 0.001 0.001 0.001 0.000 0.003 0.003 0.002 0.001 component Delivery 0 9 0.00 0.00 Water Delivery Truck 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 0 0 0.00 0.05 Total 0.003 0.001 0.001 0.022 0.010 0.002 0.001 0.001 0.001 0.001 0.000 0.005 0.004 0.002 0.002 0 7

399 Notes: 1 - Per the Project, construction of the SPGF, from site preparation and grading to commercial operation, will be expected to take 18 months (mid-2014-end 2015).

The document appears to be a technical report with data table details that do not contain pronouns needing resolution for coreference. If there are specific sections or a more narrative-style paragraph you'd like analyzed for coreference, please let me know!Construction will generally occur between 7 a.m. and 7 p.m., Monday through Friday. 2 - Emission factors developed using MOVES 3 - Heavy duty vehicle emission factors are based on the default MOVES national mix of single-unit and combination long- and short-haul trucks for year 2014 travelling at an average speed of 35 mph. 4 - The type of heavy duty vehicle, maximum quantity per day, and Max Daily Offsite Roundtrip Distance per Vehicle within general area (miles/day) are provided from the K Road Solar Project. 5 - Roundtrip mileage for Max Daily Onsite Roundtrip Distance per Vehicle (miles/day) is based on (1) information from draft EIS: a 2.5-mile gravel access road connects the SPGF to the existing paved frontage road adjacent to I-15, and (2) the assumption that the distance per day = 5 miles per roundtrip (on the 2.5-mile gravel access road) + 2.5 miles per roundtrip (distance travelled in and out on a 1,000 acre site if the site is 1.25 miles x 1.25 miles) = 7.5 miles per roundtrip.Moapa Solar PV Construction - On-Road Vehicle Exhaust - Commute Vehicles Expected Construction Start 7/1/2014 Expected Construction End 12/31/2015 2014 Construction Duration 131 days 2015 Construction Duration 261 days 2014 Worker Commute Emission Factors (g/mi) 2014 Worker Commute Emissions (tpy) Max Daily Offsite Roundtrip Duration Worker Passenger Vehicles Distance per Vehicle within NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 (days) general area (miles/day) 300 100 131 0.695 3.05 0.007 0.134 0.048 0.028 3.012 13.210 0.031 0.581 0.209 0.119 2014 Worker Commute 2014 Worker Commute Emissions (tpy) Emission Factors (g/mi) Max Daily Offsite Roundtrip CO2e Duration Worker Passenger Vehicles Distance per Vehicle within CO2 N2O CH4 CO2 N2O CH4 (metric (days) general area (miles/day) tons) 1556.9 300 100 131 394.712 0.004 0.008 1709.897 0.019 0.033 4 2014 Worker Commute Emission Factors (g/mi) Max Daily Offsite Roundtrip 1,3- Form- Acet- 2,2,4- Ethyl Propion- PAH (less Duration Benzene Ethanol MTBE Hexane Styrene Toluene Xylene Naphthalene Worker Passenger Vehicles Distance per Vehicle within e l E Butadiene aldehyde aldehyde Acrolein Trimethyl Benzene e aldehyde e e e e Naphthalene (days) e e e -pentane e e ) general area (miles/day) 300 100 131 0.004 0.003 0.000 0.001 0.002 0.002 0.000 0.002 0.002 0.002 0.000 0.000 0.011 0.009 0.000 0.000 2014 Worker Commute Emissions (tons) 1,3- Form- Acet- 2,2,4- Ethyl Propion- PAH (less Benzene Ethanol MTBE Butadiene aldehyde aldehyde Acrolein Trimethyl Benzene e aldehyde e e e e Naphthalene Total Worker Passenger Vehicles e l E Butadiene aldehyde aldehyde Acrolein Trimethyl b Naphthalene HAPs e e e -pentane e e ) 0.17 300 0.019 0.014 0.000 0.003 0.009 0.008 0.000 0.010 0.011 0.010 0.001 0.001 0.048 0.039 0.001 0.001 2

Moapa Solar PV Construction - On-Road Vehicle Exhaust - Commute Vehicles - Continued 2015 Worker Commute Emission Factors (g/mi) 2015 Worker Commute Emissions (tpy) Max Daily Offsite Roundtrip Duration Worker Passenger Vehicles Distance per NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 (days) Vehicle within general area (miles/day) 300 100 261 0.629 2.84 0.007 0.120 0.047 0.027 5.433 24.535 0.060 1.033 0.407 0.230 2015 Worker Commute 2015 Worker Commute Emissions (tpy) Emission Factors (g/mi) Max Daily Offsite Roundtrip CO2e Duration Worker Passenger Vehicles Distance per CO2 N2O CH4 CO2 N2O CH4 (metric (days) Vehicle within tons) general area (miles/day) 300 100 261 389.064 0.004 0.007 3357.993 0.034 0.061 3056.64 2015 Worker Commute Emission Factors (g/mi) Max Daily Offsite Roundtrip 2,2,4- Duration 1,3- Form- Acet- Ethyl Propion- PAH (less Worker Passenger Vehicles Distance per Benzene Ethanol MTBE Butadiene aldehyde aldehyde Acrolein Trimethyl- Benzene Hexane aldehyde Styrene Toluene Xylene Naphthalene Naphthalene) (days) pentane Vehicle within general area (miles/day) 300 100 261 0.004 0.003 0.000 0.001 0.002 0.002 0.000 0.002 0.002 0.002 0.000 0.000 0.010 0.008 0.000 0.000 2015 Worker Commute Emissions (tons) 2,2,4- 1,3- Form- Acet- Ethyl Propion- PAH (less Total Worker Passenger Vehicles Benzene Ethanol MTBE Butadiene aldehyde aldehyde Acrolein Trimethyl- Benzene Hexane aldehyde Styrene Toluene Xylene Naphthalene Naphthalene) HAPs pentane 300 0.033 0.024 0.000 0.005 0.016 0.014 0.001 0.017 0.019 0.018 0.001 0.001 0.084 0.068 0.003 0.001 0.306 Notes: 1 - Per the Project, construction of the Moapa Solar PV Construction, from site preparation and grading to commercial operation, be expected to take 18 months (mid-2014-end 2015).Construction will generally occur between 7 a.m. and 7 p.m., Monday through Friday. Emission factors were developed using MOVES. Worker commute emission factors are based on the default MOVES national mix of passenger cars and trucks for year 2014 traveling at an average speed of 35 mph. The number of worker passenger vehicles, and the Max Daily Offsite Roundtrip Distance per Vehicle within the general area (miles/day), is provided from the K Road Solar Project. Moapa Solar PV Construction - Fugitive Dust from Travel on Paved Roads was expected to start construction on 7/1/20, with an expected end date of 12/31/2015. The 2014 construction duration is 131 days, and the 2015 construction duration is 261 days. Paved roads emission factors are from AP-42, Section 13.2.1: Paved Roads (Final Section 1/11) where particulate emission factors follow E = k(sL)^0.91 \* (W)^1.02, where k for PM10 is 0.002 lb/VMT, k for PM2.5 is 0.00054 lb/VMT, and sL, the road surface silt loading, is 0.6 (grams per square meter), assuming less than 500 average daily traffic to represent the project.Due to the text being a largely tabular, numeric, and technical report, the use of pronouns such as "it" to refer to specific entities within the data is minimal or nonexistent. Therefore, a direct attempt to resolve coreferences, particularly with pronoun substitution as described, does not apply effectively to this text. However, for clarity, if there were any implicit pronouns or mentions of vehicles or components, they would be replaced with their respective noun phrases to maintain coherence.

Given this interpretation, I can help by explaining or answering any questions you have about the content of the report. Please let me know how you would like to proceed!3 - Roundtrip mileage for Max Daily Onsite Roundtrip Distance per Vehicle (miles/day) based on (1) information from draft Environmental Impact Statement (EIS): a 2.5-mile gravel access road connecting the solar power generation facility (SPGF) to the existing paved frontage road adjacent to Interstate 15 (I-15), and (2) the assumption that the distance per day equals 5 miles per roundtrip (on a 2.5-mile gravel access road) plus 2.5 miles per roundtrip (distance traveled in and out on a 1,000-acre site if the site is 1.25 miles by 1.25 miles), resulting in 7.5 miles per roundtrip. 4 - According to the client, 85% of roads onsite (access roads) are paved.404 Moapa Solar PV Construction - Fugitive Dust from Travel on Unpaved Roads Expected Construction Start 7/1/2014 Expected Construction End 12/31/2015 2014 Construction Duration 131 days 2015 Construction Duration 261 days Unpaved Roads emission factor from AP-42, Section 13.2.2: Unpaved Roads (11/06) a b E = [k(s/12) (W/3) ] where: surface material silt content (%) is 8.5 [Table 13.2.2-1, Construction sites mean silt content %] weighted average vehicle weight is 8 tons k= 1.5 lb/VMT [Table 13.2.2-2, for PM10] k= 0.15 lb/VMT [Table 13.2.2-2, for PM2.5] constant for PM10 and PM2.5 is 0.9 constant for PM10 and PM2.5 is 0.45 E (PM10)= 1.72 lb/VMT E (PM2.5)= 0.17 lb/VMT 2014 Emissions (tons) 2015 Emissions (tons) 2014 Total 2014 Total 2015 Total Max Daily Vehicle Vehicle Vehicle Onsite Miles Vehicle 2014 2015 2015 Total Vehicle Miles Traveled Miles Miles PM10 PM2.5 PM10 PM2.5 Roundtrip Traveled Vehicle Details Weight Maximum Quantity per day Duration Duration on Unpaved Roads Traveled \* Traveled \* Emissions Emissions Emissions Emissions Distance per on (tons) (days) (days) (VMT) Vehicle Vehicle (tons) (tons) (tons) (tons) Vehicle Unpaved Weight Weight (miles/day) Roads (tons) (tons) (VMT) Concrete Delivery Truck for 20 2 0 131 261 0 0 0 0 0.00 0.00 0.00 0.00 General Construction Dump Truck 20 1 1.125 131 261 147 294 2,948 5,873 0.13 0.01 0.25 0.03 Flatbed Truck is 10, having 5 units and traveling 1.125 daily miles over 131 and 261 days in each year respectively with a total VMT of 737 in 2014 and 1,468 in 2015. These travel distances lead to PM10 emissions of 0.63 tons in 2014 and 1.26 tons in 2015, and PM2.5 emissions of 0.06 tons in 2014 and 0.13 tons in 2015. Staff & Security Truck weighs 2.25 tons, operates with 4 vehicles completing 1.125 miles daily for the durations of 131 and 261 days annually. The vehicle's VMT are 590 in 2014 and 1,175 in 2015, producing PM10 emissions of 0.51 tons and 1.01 tons for each year, along with PM2.5 emissions of 0.05 tons and 0.10 tons. Pickup Truck weighs 4 tons, travels with 10 vehicles at a distance of 1.125 miles daily during the construction periods of both years, accumulating VMTs of 1,474 and 2,936. Correspondingly, emissions for PM10 are 1.27 tons in 2014, and 2.53 tons in 2015, and for PM2.5 they are 0.13 tons and 0.25 tons, respectively. Road Preparation Materials Truck weighs 20 tons, without daily mileage for 131 and 261 days, resulting in zero VMT and emissions. General Materials Delivery Truck for General Construction is unspecified in weight, travels with a count of 20 during two separate annual periods, accumulating zero VMT and emissions. This results in zero emissions of both PM10 and PM2.5. PV Module, Tracker, & Electrical component Delivery vehicle is of unspecified weight, similarly involves 12 vehicles across the durations, leading to zero travel miles and emissions. The emissions yielded are zero for both PM10 and PM2.5 throughout 2014 and 2015. Water Delivery Truck weight is 30 tons and it travels with 2 vehicles completing 1.125 miles across the full duration of construction for both years. The VMT totals reach 295 in 2014 and 587 in 2015, translating to PM10 emissions of 0.25 tons and PM2.5 emissions of 0.03 tons for each year respectively. It emits 0.51 tons of PM10 in 2015, and 0.05 tons for PM2.5 in 2015. Worker Passenger Vehicles tally 300 units, at 1.25 tons each, and operate with a daily mileage of zero across construction periods yielding zero miles traveled and emissions. In total, the vehicles emit 3,242 PM10 emissions and 6,460 PM2.5 emissions in 2014, while in 2015 the figures are 26,380 for PM10 and 52,559 for PM2.5. Total emissions for PM10 are calculated to be 2.79 tons in 2014, and 5.57 tons in 2015. Similarly, total PM2.5 emissions are 0.28 tons in 2014, and 0.56 tons in 2015. Weighted average vehicle wt (tons) is calculated as 8.14. Notes: Per the Project, construction of the SPGF, from site preparation and grading to commercial operation, will be expected to take 18 months (mid-2014-end 2015). Construction will generally occur between 7 a.m. and 7 p.m., Monday through Friday.2 - The type of heavy duty vehicle, maximum quantity per day, vehicle weight, and Max Daily Offsite Roundtrip Distance per Vehicle within the general area (miles/day) provided from the K Road Solar Project. 405 3 - Roundtrip mileage for the Max Daily Onsite Roundtrip Distance per Vehicle (miles/day) is based on (1) information from the draft EIS: a 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15, and (2) the assumption that the distance per day equals 5 miles per roundtrip (on the 2.5-mile gravel access road) plus 2.5 miles per roundtrip (distance traveled in and out on the 1,000-acre site if the site is 1.25 miles X 1.25 miles), resulting in 7.5 miles per roundtrip. 4 - Per client, 85% of roads onsite (access roads) are paved, which means 15% are unpaved. 406 "Moapa Solar PV Construction - Fugitive Dust from Construction Activities 2014 Emissions Amount of Soil Area Disturbed PM10 Emission Factor PM10 Emissions Dust Control Efficiency PM10 PM2.5 Construction Activity Disturbed (acres) (lb/ton) (tons) (%) (tons) (tons) (tons) Access Road Construction 200 435,600 0.058 12.63 50% 6.32 1.31 Parking and Laydown 100 108,900 0.058 3.16 50% 1.58 0.33 Site Grading 200 217,800 0.058 6.32 50% 3.16 0.66 Total 11.05 2.30 2014 Emissions 2015 Emissions Amount of Soil Amount of Soil Amount of Soil Total Amount of Soil PM10 Emission Factor PM10 Emissions Dust Control Efficiency PM10 PM2.5 PM10 PM2.5 Construction Activity Excavated Excavated Backfilled (tons) (lb/ton) (tons) (%) (tons) (tons) (tons) (tons) (cf) (tons) (tons) Excavation 135,000 6,750 6,750 13,500 0.058 0.39 50% 0.10 0.02 0.10 0.02 Total 0.10 0.02 0.10 0.02 Grand Total 11.15 2.32 0.10 0.02 Notes: 1 - The area disturbed for access road construction is assumed to be 20% of the 1,000-acre site, 10% for parking and laydown, and 20% for site grading. The depth disturbed for access road construction is assumed to be 12 inches, 6 inches for parking and laydown, and 6 inches for site grading. Access road construction, parking and laydown, and site grading are assumed to occur in 2014. The amount of soil disturbed uses a 100 lb/cf soil density and the conversion of 43,560 sq ft equals 1 acre. 2 - An assumption that can be made is 15,000 cf per mile of transmission line based on an average volume excavated from a recent transmission line project for 4.5 structures per mile of 345 kV double circuit lattice tower and 5.5 structures per mile of 230 kV double circuit tubular poles. Using information from the draft EIS, "Approximately 7.5 miles of single-circuit 230-kV overhead transmission line from the SPGF to the Harry Allen 230-kV Substation" and "Approximately 1.5 miles of single-circuit 500-kV overhead transmission line from the SPGF to the 500 kV Crystal Valley Substation" equals 9 total miles of transmission lines. 9 multiplied by 15,000 cf per mile of transmission line equals 135,000 cf of soil excavated. 3 - Disturbance emission factors are from AP-42, Table 11.9-4 (dated 7/98), assuming 100% of TSP is PM10. 4 - PM10 emissions are conservatively assumed to be 100% of TSP. 5 - PM2.5 emissions were calculated following the SCAQMD Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology, October 2006. For construction and demolition fugitive dust sources, 20.8% of the PM10 would be PM2.5.Here is the revised text with coreference resolution:

6 - PM emissions are controlled by watering or use of other tackifier, with a control efficiency assumed to be 50%.

407 Summary of PV Operational Emissions CO2e TOTAL NOx CO SO2 VOC PM10 PM2.5 CO2 N2O CH4 SF6 (metric HAP Operation Emission Category (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) tons) (tons). Paved Roads report no emissions except VOC at 0.58 tons and PM2.5 at 0.14 tons. Unpaved Roads report VOC emissions at 3.74 tons and PM2.5 at 0.37 tons. On-Road Vehicle Exhaust - Heavy Duty Vehicles produce CO2e emissions with CO2 at 61.33 tons and CO2e at 55.68 tons. Specific emissions reported are: NOx at 0.40 tons, CO at 0.16 tons, SO2 at 0.00 tons, VOC at 0.02 tons, PM10 at 0.02 tons, PM2.5 at 0.02 tons, N2O at 1.19E-04 tons, CH4 at 1.14E-03 tons, and HAP at 3.88E-03 tons. On-Road Vehicle Exhaust - Commute Vehicles result in CO2e emissions, with CO2 at 223.87 tons and CO2e at 203.78 tons. Specific emissions are: NOx at 0.36 tons, CO at 1.64 tons, SO2 at 4.03E-03 tons, VOC at 0.07 tons, PM10 at 0.03 tons, PM2.5 at 0.02 tons, N2O at 2.30E-03 tons, CH4 at 4.05E-03 tons, and HAP at 0.02 tons. Circuit Breaker SF6 Emissions contributes to SF6 emissions at 0.005 tons and CO2e at 97.55 tons. Diesel Fire-Pump Emissions results in CO2e emissions with CO2 at 8.21 tons and CO2e at 7.47 tons. Specific emissions include: NOx at 0.20 tons, CO at 0.05 tons, SO2 at 0.01 tons, VOC at 1.76E-02 tons, PM10 at 0.02 tons, PM2.5 at 0.02 tons, N2O at 0.02 tons, CH4 at 0.01 tons, and HAP at 5.02E-04 tons. Diesel Generator Emissions result in CO2e emissions, with CO2 at 23.68 tons and CO2e at 21.56 tons. Specific emissions are: NOx at 0.59 tons, CO at 0.14 tons, SO2 at 0.04 tons, VOC at 5.08E-02 tons, PM10 at 0.05 tons, PM2.5 at 0.05 tons, N2O at 0.06 tons, CH4 at 0.02 tons, and HAP at 1.45E-03 tons. Total emissions are NOx at 1.56 tons, CO at 1.98 tons, SO2 at 0.06 tons, VOC at 0.16 tons, PM10 at 4.43 tons, PM2.5 at 0.61 tons, CO2 at 317.09 tons, N2O at 0.08 tons, CH4 at 0.03 tons, SF6 at 4.50E-03 tons, and CO2e at 386.04 tons. HAP emissions are at 0.03 tons.

408 Moapa Operation Emissions - SF6 Emissions from Circuit Breaker Leakage. The Circuit Breakers at Moapa report SF6 emissions at 0.005 tons and CO2e emissions at 97.55 metric tons per year. The Circuit Breakers have a size of 230 kV. The Circuit Breaker Leak Rate falls within a range of 1.5 to 3 lbs SF6 per year. The assumption is that each 230 kV Breaker contains 160 lbs. of gas and leaks about 1.5 to 3 lbs. of gas annually. The high-end leak rate range is used in calculations. An example calculation is: Number of Circuit Breakers multiplied by lbs SF6 per year for kV divided by 2000 lbs per year as referenced by The Climate Registry Electric Power Sector Protocol, Version 1.1, March 2009. SF6 has a Global Warming Potential (GWP) of 23,900.

409 Moapa Operation Emissions - Diesel Fire-Pump Emissions are calculated using Emission Factors: NOx + HC at 4.41 lb/MMBtu, CO at 0.95 lb/MMBtu, SO2 at 0.290 lb/MMBtu, VOC at 0.350 lb/MMBtu, and PM at 0.31 lb/MMBtu. Heat Input is 2.0 MMBtu/hr. The Diesel Heating Value is 19,300 Btu/lb, with Fuel Use at 104 lb/hr. Fuel Density is 7.05 lb/gal, and Fuel Use is 14.8 gal/hr and 740 gal/yr. PTE emission calculations use these factors.Pollutant EF Source Factor (lb/hr) Hrs tpy lb/MMBt NOx AP-42, Table 3.3-1 4.06 u 8.18 50 0.20 lb/MMBt CO AP-42, Table 3.3-1 0.95 u 1.91 50 0.05 lb/MMBt SO2 AP-42, Table 3.3-1 0.29 u 0.5840 50 0.01 lb/MMBt VOC AP-42, Table 3.3-2 0.35 u 0.70 50 0.02 lb/MMBt PM AP-42, Table 3.3-1 3.10E-01 u 0.62 50 0.02 lb/MMBt 5.94E- HCHO AP-42, Table 3.3-2 1.18E-03 u 2.38E-03 50 05 lb/MMBt 3.86E- Acetaldehyde AP-42, Table 3.3-2 7.67E-04 u 1.54E-03 50 05 lb/MMBt 4.66E- Acrolein AP-42, Table 3.3-2 9.25E-05 u 1.86E-04 50 06 lb/MMBt 4.70E- Benzene AP-42, Table 3.3-2 9.33E-04 u 1.88E-03 50 05 lb/MMBt 1.30E- Propylene AP-42, Table 3.3-2 2.58E-03 u 5.20E-03 50 04 lb/MMBt 2.06E- Toluene AP-42, Table 3.3-2 4.09E-04 u 8.24E-04 50 05 lb/MMBt 4.27E- Naphthalene AP-42, Table 3.3-2 8.48E-05 u 1.71E-04 50 06 lb/MMBt 1.43E- Xylene AP-42, Table 3.3-2 2.85E-04 u 5.74E-04 50 05 lb/MMBt 1.26E- Methanol AP-42, Table 3.3-2 2.50E-03 u 5.03E-03 50 04 lb/MMBt 5.59E- n-Hexane AP-42, Table 3.3-2 1.11E-03 u 2.24E-03 50 05 lb/MMBt 1.97E- 1,3-Butadiene AP-42, Table 3.3-2 3.91E-05 u 7.87E-05 50 06 Total HAPs 0.00

Moapa Operation Emissions - Diesel Fire-Pump Emissions - Continued Greenhouse Gas Emissions PTE Emission Emissions Op. Pollutant EF Source Factor (lb/hr) Hrs tpy EPA MRR Table kg/MMBt CO2 C-1 73.96 u 328 50 8 EPA MRR Table kg/MMBt CH4 (as CO2e) C-2 0.003 u 0.28 50 0.01 EPA MRR Table kg/MMBt N2O (as CO2e) C-2 0.0006 u 0.83 50 0.02 CO2e 329 8 Notes: Emission factors as per 40 CFR Part 98, Tables C-1 and C-2

Moapa Operation Emissions - Diesel Generator Emissions Emission Factors NOx + HC: 4.41 lb/MMBtu CO: 0.95 lb/MMBtu SO2: 0.290 lb/MMBtu VOC: 0.350 lb/MMBtu PM: 0.31 lb/MMBtu Heat Input (MMBtu/hr) 5.8 Diesel Heating Value (Btu/lb) 19,300 Fuel Use (lb/hr) 301 Fuel Density (lb/gal) 7.05 Fuel Use (gal/hr) 42.7 Fuel Use (gal/yr) 2,135 PTE Emission Emissions Op.Here is the revised text with coreference resolution applied:

Pollutant EF Source Factor (lb/hr) Hrs tpy NOx AP-42, Table 3.3-1 4.06 lb/MMBtu 23.59 50 0.59 CO AP-42, Table 3.3-1 0.95 lb/MMBtu 5.52 50 0.14 SO2 AP-42, Table 3.3-1 0.29 lb/MMBtu 1.6849 50 0.04 VOC AP-42, Table 3.3-2 0.35 lb/MMBtu 2.03 50 0.05 PM AP-42, Table 3.3-1 3.10E-01 lb/MMBtu 1.80 50 0.05 1.71E- HCHO AP-42, Table 3.3-2 1.18E-03 lb/MMBtu 6.86E-03 50 04 1.11E- Acetaldehyde AP-42, Table 3.3-2 7.67E-04 lb/MMBtu 4.46E-03 50 04 1.34E- Acrolein AP-42, Table 3.3-2 9.25E-05 lb/MMBtu 5.37E-04 50 05 1.36E- Benzene AP-42, Table 3.3-2 9.33E-04 lb/MMBtu 5.42E-03 50 04 3.75E- Propylene AP-42, Table 3.3-2 2.58E-03 lb/MMBtu 1.50E-02 50 04 5.94E- Toluene AP-42, Table 3.3-2 4.09E-04 lb/MMBtu 2.38E-03 50 05 1.23E- Naphthalene AP-42, Table 3.3-2 8.48E-05 lb/MMBtu 4.93E-04 50 05 4.14E- Xylene AP-42, Table 3.3-2 2.85E-04 lb/MMBtu 1.66E-03 50 05 3.63E- Methanol AP-42, Table 3.3-2 2.50E-03 lb/MMBtu 1.45E-02 50 04 1.61E- n-Hexane AP-42, Table 3.3-2 1.11E-03 lb/MMBtu 6.45E-03 50 04 5.68E- 1,3-Butadiene AP-42, Table 3.3-2 3.91E-05 lb/MMBtu 2.27E-04 50 06 Total HAPs 0.00

412 Moapa Operation Emissions - Diesel Generator Emissions - Continued Greenhouse Gas Emissions PTE Emission Emissions Op. Pollutant EF Source Factor (lb/hr) Hrs tpy EPA MRR Table CO2 C-1 73.96 kg/MMBtu 947 50 24 EPA MRR Table CH4 (as CO2e) C-2 0.003 kg/MMBtu 0.81 50 0.02 EPA MRR Table N2O (as CO2e) C-2 0.0006 kg/MMBtu 2.38 50 0.06 CO2e 951 24 Notes: Emission factors as per 40 CFR Part 98, Tables C-1 and C-2

413 Moapa Solar Operation - Fugitive Dust from Travel on Paved Roads Annual Operation 261 days Paved Roads emission factors from AP-42, Section 13.2.1: Paved Roads (Final Section 1/11) k(sL)^0.91 \* E= (W)^1.02 where: Particulate E= emission factor 0.00 lb/VMT [Table 13.2.1-1, particle size k= 22 multiplier for PM10] 0.00 lb/VMT [Table 13.2.1-1, particle size k= 054 multiplier for PM2.5] [road surface silt loading (grams per square meter (g/m2)), Table 13.2.1-2] Assumed less than sL = 0.6 500 average daily traffic to represent the project.

The text primarily consists of technical data and emission factors that do not include pronouns referring to noun phrases. Therefore, no substitutions or changes are necessary in the provided text. If you have any other text where you would like me to perform coreference resolution, please feel free to share it!\*\*Revised Text:\*\*

Tons [weighted average W= 2 vehicle weight] 0.00 E (PM10)= lb/VMT 2 0.00 E (PM2.5)= lb/VMT 05 Annually Max Total Daily Vehicle Maximum Offsite vehicle Daily Roundtrip Mile Onsite Vehicle trip distance Roundtrip Distance traveled vehicle Weight per Duration Total Vehicle Miles on Paved Roads traveled Emissions Emissions Vehicle Details Quantity per Distance (day vehicle/day (VMT) (tons) (tons) day/vehicle per weight (tons) day (miles) day) (tons) (miles/ day) Staff & Security Truck: Vehicle weight is 2.25 tons, and maximum distance per day is 4 miles. Total vehicle miles traveled on paved roads per day equals 6.375. Vehicle travels 261 days a year. Total vehicle miles traveled annually equals 6,656 miles. Vehicle results in 0.01 tons of PM10 emissions and 0.00 tons of PM2.5 emissions annually. Maximum vehicle details quantity per day is 14,975.

Pickup Truck: Vehicle weight is 4 tons, and maximum distance per day is 10 miles. Total vehicle miles traveled on paved roads per day equals 6.375. Vehicle travels 261 days a year. Total vehicle miles traveled annually equals 16,639 miles. Vehicle results in 0.02 tons of PM10 emissions and 0.00 tons of PM2.5 emissions annually. Maximum vehicle details quantity per day is 66,555.

Water Delivery Truck: Vehicle weight is 30 tons, and maximum distance per day is 2 miles. Total vehicle miles traveled on paved roads per day equals 6.375. Vehicle travels 261 days a year. Total vehicle miles traveled annually equals 3,328 miles. Vehicle results in 0.00 tons of PM10 emissions and 0.00 tons of PM2.5 emissions annually. Maximum vehicle details quantity per day is 99,841.

Worker Passenger Vehicles: Vehicle weight is 1.25 tons, and maximum quantity per day is 20 vehicles. Maximum distance per day is 100 miles. Total vehicle miles traveled on paved roads per day equals 261. Vehicle travels a total of 522,000 miles annually. The collective result for worker passenger vehicles is 0.55 tons of PM10 emissions and 0.14 tons of PM2.5 emissions annually. Maximum vehicle details quantity per day is 652,512.

Total: All vehicles together travel 548,622 miles annually and result in 0.58 tons of PM10 emissions and 0.14 tons of PM2.5 emissions per year. Maximum vehicle details total quantity per day equals 833,883.

Weighted average: Vehicle weight is 1.52 tons.

Notes:

1. Vehicle operations are assumed from 7 a.m. to 7 p.m., Monday through Friday.

2. The type of vehicle, maximum quantity per day, vehicle weight, and Maximum Daily Offsite Roundtrip Distance per vehicle within the general area (miles/day) are provided from the K Road Solar Project. These results are modified into assumptions for operation, based on 20 workers as an example.

3. Roundtrip mileage for Maximum Daily Onsite Roundtrip Distance per vehicle (miles/day) is based on information from the draft EIS. The calculation assumes a 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15. It is also assumed that the distance per day equals 5 miles per roundtrip (on the 2.5-mile gravel access road) plus 2.5 miles per roundtrip (distance traveled in and out on a 1,000-acre site if the site is 1.25 miles x 1.25 miles), totaling 7.5 miles per roundtrip.

4. According to the client, 85% of roads onsite (access roads) are paved.Certainly! Here's the revised version of your text with coreference resolution:

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415 Moapa Solar Operation - Fugitive Dust from Travel on Unpaved Roads Annual 261 days Operation Unpaved Roads emission factor from AP-42, Section 13.2.2: Unpaved Roads (11/06) a b E= [k(s/12) (W/3) ] where: s= 8.5 surface material silt content (%) [Table 13.2.2-1, Construction sites mean silt content %] tons [weighted average vehicle W= 7 weight] k= 1.5 lb/VMT [Table 13.2.2-2, for PM10 ] k= 0.15 lb/VMT [Table 13.2.2-2, for PM2.5] a= 0.9 constant [Table 13.2.2-2, for PM10 and PM2.5] b= 0.45 constant [Table 13.2.2-2, for PM10 and PM2.5] E (PM10)= 1.59 lb/VMT E (PM2.5)= 0.16 lb/VMT Annually Max Daily Total Onsite Vehicle Vehicle Roundtrip Miles PM10 PM2.5 Duration Total Vehicle Miles Traveled Traveled\* Emission Emission Vehicle Details Weight Maximum Quantity per day Distance on Unpaved Roads (days) (VMT) Vehicle (tons) (tons) (tons) Vehicle Weight (miles/day) Staff & Security 2.25 4 1.125 261 1,175 2,643 0.93 0.09 Truck Pickup Truck 4 10 1.125 261 2,936 11,745 2.34 0.23 Water Delivery Truck 30 2 1.125 261 587 17,618 0.47 0.05 Worker Passenger Vehicles 1.25 20 0 261 0 0 0.00 0.00 Total 4,698 32,005 3.74 0.37 Weighted average vehicle weight 6.81

416 (tons) Notes: 1 - Operation is assumed to be 7 a.m. and 7 p.m., Monday through Friday. 2 - The type of vehicle, maximum quantity per day, vehicle weight, and Max Daily Offsite Roundtrip Distance per Vehicle within the general area (miles/day) is provided from the K Road Solar Project and modified into assumptions for operation (i.e., 20 workers). 3 - Roundtrip mileage for Max Daily Onsite Roundtrip Distance per Vehicle (miles/day) is based on (1) information from draft EIS: a 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15, and (2) the assumption that the distance per day = 5 miles per roundtrip (on a 2.5-mile gravel access road) + 2.5 miles per roundtrip (distance traveled in and out on a 1,000-acre site if the site is 1.25 miles X 1.25 miles) = 7.5 miles per roundtrip. 4 - Per client, 85% of roads onsite (access roads) are paved, which means 15% are unpaved.

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This revision replaces pronouns found in the original text with the corresponding noun phrases and makes slight adjustments for readability and grammatical consistency.Here is the original document revised with pronouns replaced by their respective noun phrases where applicable:

417 Moapa Solar Operation - On-Road Vehicle Exhaust - Heavy Duty Vehicles Annual Operation 261 days 2015 Heavy Duty Vehicle Emission Factors (g/mi) Annual Heavy Duty Vehicle Emissions (tons) Max Daily Onsite Roundtrip Maximum Quantity Max Daily Offsite Roundtrip Distance per Duration Heavy Duty Vehicle Details Distance per Vehicle NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 per day Vehicle within general area (miles/day) (days) (miles/day) Staff & Security Truck 4 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.100 0.040 0.000 0.005 0.006 0.005 Pickup Truck 10 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.250 0.100 0.000 0.012 0.015 0.013 Water Delivery Truck 2 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.050 0.020 0.000 0.002 0.003 0.003 Total 0.400 0.159 0.000 0.020 0.024 0.021 2015 Heavy Duty Vehicle Annual Heavy Duty Vehicle Emission Factors (g/mi) Emissions (tons) Max Daily Onsite Roundtrip CO2e Maximum Quantity Max Daily Offsite Roundtrip Distance per Duration Heavy Duty Vehicle Details Distance per Vehicle CO2 N2O CH4 CO2 N2O CH4 (metric per day Vehicle within general area (miles/day) (days) (miles/day) tons) Staff & Security Truck 4 0 7.5 261 1776.44 0.003 0.03 15.332 0.000 0.000 13.92 Pickup Truck 10 0 7.5 261 1776.44 0.003 0.03 38.331 0.000 0.001 34.80 Water Delivery Truck 2 0 7.5 261 1776.44 0.003 0.03 7.666 0.000 0.000 6.96 Total 61.329 0.000 0.001 55.683

418 Moapa Solar Operation - On-Road Vehicle Exhaust - Heavy Duty Vehicles - Continued 2015 Heavy Duty Vehicle Emission Factors (g/mi) Max Daily Max Daily Onsite Offsite Roundtrip Propion Maximum Roundtrip Duration 1,3- Form- Acet- 2,2,4- Ethyl PAH (less Heavy Duty Vehicle Distance Benzen Ethano MTB Acrolei Hexan - Styren Toluen Xylen Naphthalen Quantity per Distance per n e l E Butadien aldehyd aldehyd n Trimethy Benzen e aldehyd e e e e Naphthalen Details per e e e l-pentane e e) day Vehicle within (days) e Vehicle general area (miles/day) (miles/day) 0.00 Staff & Security Truck 4 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 0.00 Pickup Truck 10 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 0.00 Water Delivery Truck 2 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 Annual Heavy Duty Vehicle Emissions (tons) Propion 1,3- Form- Acet- 2,2,4- Ethyl PAH (less Heavy Duty Vehicle Benzen Ethano MTB Acrolei Hexan - Styren Toluen Xylen Naphthalen Total Butadien aldehyd aldehyd Trimethy Benzen Naphthalen Details e l E n e aldehyd e e e e HAPs e e e l-pentane e e) e 0.00 Staff & Security Truck 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 0.001 0 0.00 Pickup Truck 0.000 0.000 0.000 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.002 0 0.00 Water Delivery Truck 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 0.000 0 0.00 3.88E- Total 0.000 0.000 0.000 0.001 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0 03 Notes: 1 - Operation assumed to be 7 a.m. and 7 p.m., Monday through Friday.2 - Emission factors developed using MOVES. Year 2015 was used. 3 - Heavy duty vehicle emission factors based on the default MOVES national mix of single-unit and combination long- and short-haul trucks for year 2014 travelling at an average speed of 35 mph. 4 - The type of heavy duty vehicle, maximum quantity per day, and Max Daily Offsite Roundtrip Distance per Vehicle within general area (miles/day) provided from the K Road Solar Project and modified into assumptions for operation. 5 - Roundtrip mileage for Max Daily Onsite Roundtrip Distance per Vehicle (miles/day) based on (1) information from draft EIS: 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15, and (2) the assumption that the distance per day = 5 miles per roundtrip (on 2.5-mile gravel access road) + 2.5 miles per roundtrip (distance traveled in and out on 1,000 acre site if site is 1.25 miles X 1.25 miles) = 7.5 miles per roundtrip. 419 Moapa Solar Operation - On-Road Vehicle Exhaust - Commute Vehicles Annual Operation 261 days 2015 Worker Commute Emission Factors (g/mi) Annual Worker Commute Emissions (tpy) Max Daily Offsite Roundtrip Duration Worker Passenger Vehicles Distance per Vehicle within NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 (days) general area (miles/day) 20 100 261 0.629 2.84 0.007 0.120 0.047 0.027 0.362 1.636 0.004 0.069 0.027 0.015 2015 Worker Commute Annual Worker Commute Emissions Emission Factors (g/mi) (tpy) Max Daily Offsite Roundtrip CO2e Duration Worker Passenger Vehicles Distance per Vehicle within CO2 N2O CH4 CO2 N2O CH4 (metric (days) general area (miles/day) tons) 20 100 261 389.064 0.004 0.007 223.866 0.002 0.004 203.78 2015 Worker Commute Emission Factors (g/mi) Max Daily Offsite Roundtrip 2,2,4- Duration 1,3- Form- Acet- Ethyl Propion- PAH (less Worker Passenger Vehicles Distance per Vehicle within Benzene Ethanol MTBE Butadiene aldehyde aldehyde Acrolein Trimethyl- Benzene Hexane aldehyde Styrene Toluene Xylene Naphthalene Naphthalene) (days) pentane general area (miles/day) 20 100 261 0.004 0.003 0.000 0.001 0.002 0.002 0.000 0.002 0.002 0.002 0.000 0.000 0.010 0.008 0.000 0.000 Annual Worker Commute Emissions (tons) 2,2,4- 1,3- Form- Acet- Ethyl Propion- PAH (less Total Worker Passenger Vehicles Benzene Ethanol MTBE Butadiene aldehyde aldehyde Acrolein Trimethyl- Benzene Hexane aldehyde Styrene Toluene Xylene Naphthalene Naphthalene) HAPs pentane 20 0.002 0.002 0.000 0.000 0.001 0.001 0.000 0.001 0.001 0.001 0.000 0.000 0.006 0.005 0.000 0.000 0.020 Notes: 1 - Operation assumed to be 7 a.m. and 7 p.m., Monday through Friday. 2 - Emission factors developed using MOVES. Year 2015 was used. 3 - Worker commute emission factors are based on the default MOVES national mix of passenger cars and trucks for year 2015 travelling at an average speed of 35 mph. 4 - The type of vehicle, maximum quantity per day, and Max Daily Offsite Roundtrip Distance per Vehicle within general area (miles/day) provided from the K Road Solar Project and modified into assumptions for operation.

Since the text is highly technical and lacks pronouns referring to noun phrases, no replacements were necessary. If you have another section or document that would benefit from coreference resolution, please provide it.Here is the revised text with coreference resolution applied:

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420 Summary of Decommission Emissions NOx CO SO2 VOC PM10 PM2.5 CO2 N2O CH4 CO2e TOTAL HAP Decommission Emission Category (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) (metric tons) (tons) Construction Equipment Exhaust 0.82 0.49 1.07E-03 0.11 0.08 0.08 - - - - - On-Road Vehicle Exhaust - Heavy Duty Vehicles 0.07 0.03 9.15E-05 3.72E-03 4.49E-03 3.87E-03 11.42 2.22E-05 2.12E-04 10.36 7.22E-04 On-Road Vehicle Exhaust - Commute Vehicles 0.08 0.34 8.50E-04 1.45E-02 5.72E-03 3.23E-03 47.17 4.84E-04 8.53E-04 42.94 4.30E-03 Fugitive Dust from Travel on Paved Roads - - - - 0.14 0.04 - - - - - Fugitive Dust from Travel on Unpaved Roads - - - - 0.47 0.05 - - - - - Total 0.97 0.87 0.00 0.13 0.71 0.17 58.59 0.00 0.00 53.31 0.01

421 Moapa Solar Decommission - Construction Equipment Exhaust Construction Duration 22 days Mon-Fri 12 hours/day Duration Duration 2015 Construction Equipment Emission Factors (g/hp-hr) 2015 Construction Equipment Emissions (tons) Model Equipment Types Fuel Type Horsepower (hp) Number (days) (hours) NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 Aerial Lifts Diesel 50 1 22 264 5.59 6.32 0.004 1.643 0.907 0.907 0.081 0.092 0.000 0.024 0.013 0.013 Concrete/Industrial Saws Diesel 50 1 22 264 4.05 1.23 0.004 0.230 0.197 0.197 0.059 0.018 0.000 0.003 0.003 0.003 Cranes Diesel 175 1 22 264 2.48 0.647 0.003 0.209 0.156 0.156 0.127 0.033 0.000 0.011 0.008 0.008 Dumpers/Tenders Diesel 50 1 22 264 5.38 5.59 0.004 1.379 0.849 0.849 0.078 0.081 0.000 0.020 0.012 0.012 Excavators Diesel 175 2 22 264 1.82 0.797 0.003 0.174 0.192 0.192 0.186 0.081 0.000 0.018 0.020 0.020 Off-Highway Trucks Diesel 300 1 22 264 1.13 0.274 0.003 0.141 0.045 0.045 0.099 0.024 0.000 0.012 0.004 0.004 Rough Terrain Forklifts Diesel 75 1 22 264 3.73 2.54 0.004 0.284 0.294 0.294 0.081 0.055 0.000 0.006 0.006 0.006 Tractors/Loaders/Backhoes Diesel 75 1 22 264 5.00 5.03 0.004 0.879 0.728 0.728 0.109 0.110 0.000 0.019 0.016 0.016 Total 0.82 0.49 0.001 0.113 0.082 0.082 Notes: 1 - Decommission assumed to last 1 month, 7 a.m. to 7 p.m., Monday through Friday.

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In this text, most of the instances are numerical data and references to emissions and equipment, so there aren't common pronouns to replace. Please let me know if there is another text or section you would like assistance with.2 - Construction equipment emission factors developed using the EPA NONROAD model. Year 2015 was used because the decommission year for the construction equipment is not yet known. 3 - Construction equipment number, type, and HP rating was assumed: A mid-range HP value was chosen for each construction equipment category.The original text provided seems to be a structured data report or table rather than a narrative text that requires coreference resolution. There are no pronouns like "he," "she," "it," or "they" that typically require the task of coreference resolution. Instead, the text consists of details about vehicle emissions and logistics for a solar decommissioning project.

If there is a specific narrative or text with pronouns you would like me to resolve, please share that, and I will be happy to assist.Here is the revised text with coreference resolution applied:

2 - Emission factors developed using MOVES. Year 2015 was used because the decommission year is not yet known. 3 - Heavy-duty vehicle emission factors are based on the default MOVES national mix of single-unit and combination long- and short-haul trucks for year 2014, traveling at an average speed of 35 mph. 4 - The type of heavy-duty vehicle, maximum quantity per day, and Max Daily Offsite Roundtrip Distance per Vehicle within the general area (miles/day) are provided from the K Road Solar Project and modified into assumptions for decommissioning. 5 - Roundtrip mileage for Max Daily Onsite Roundtrip Distance per Vehicle (miles/day) is based on (1) information from the draft EIS: a 2.5-mile gravel access road connects the SPGF to the existing paved frontage road adjacent to I-15, and (2) the assumption that the distance per day is 5 miles per roundtrip (on the 2.5-mile gravel access road) + 2.5 miles per roundtrip (distance traveled in and out on a 1,000-acre site if the site is 1.25 miles X 1.25 miles) = 7.5 miles per roundtrip. 424 Moapa Solar Decommission - On-Road Vehicle Exhaust - Commute Vehicles 2015 Construction 22 days Duration 2015 Worker Commute Emission Factors (g/mi) 2015 Worker Commute Emissions (tpy) Max Daily Offsite Roundtrip Duration Worker Passenger Distance per Vehicle within the general area (miles/day) is 50. NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 Vehicles area (miles/day) (days) 50 100 22 0.629 2.84 0.007 0.120 0.047 0.027 0.076 0.345 0.001 0.015 0.006 0.003 2015 Worker Commute 2015 Worker Commute Emissions (tpy) Emission Factors (g/mi) Max Daily Offsite Roundtrip Duration CO2e Worker Passenger Distance per Vehicle within the general area (miles/day) is 50. CO2 N2O CH4 CO2 N2O CH4 (metric Vehicles area (miles/day) (days) 50 100 22 389.064 0.004 0.007 47.175 0.000 0.001 42.94 2015 Worker Commute Emission Factors (g/mi) Max Daily Offsite Roundtrip Duration 1,3- Form- Acet- 2,2,4- Ethyl Propion- PAH (less Worker Passenger Acrolei Hexan Styrene Toluene Xylene Naphthalen Distance per Vehicle within the general area (miles/day) is 50. Benzene Ethanol MTBE Butadiene aldehyde aldehyde Trimethyl Benzene aldehyde e Naphthalene Vehicles e e e e e e e ) area (miles/day) (days) 50 100 22 0.004 0.003 0.000 0.001 0.002 0.002 0.000 0.002 0.002 0.002 0.000 0.000 0.010 0.008 0.000 0.000 2015 Worker Commute Emissions (tons) 1,3- Form- Acet- 2,2,4- Ethyl Propion- PAH (less Worker Passenger Acrolei Hexan Styrene Toluene Xylene Naphthalen Total Benzene Ethanol MTBE Butadiene aldehyde aldehyde Trimethyl Benzene aldehyde Naphthalene Vehicles e e e e e e HAPs e e e -pentane e e ) 0.00 50 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.001 0.001 0.000 0.000 4 Notes: 1 - Decommission is assumed to last 1 month, from 7 a.m. to 7 p.m., Monday through Friday. 2 - Emission factors are developed using MOVES. Year 2015 was used because the decommission year is not yet known. 3 - Worker commute emission factors are based on the default MOVES national mix of passenger cars and trucks for year 2014, traveling at an average speed of 35 mph.

This revision ensures that the pronouns are replaced with their respective noun phrases where appropriate, particularly avoiding altering pleonastic uses of "it."4 - The type of heavy duty vehicle, the maximum quantity per day, and Max Daily Offsite Roundtrip Distance per Vehicle within the general area (miles/day) provided from the K Road Solar Project and modified into assumptions for decommissioning (i.e., 50 workers). 425 Moapa Solar Decommission - Fugitive Dust from Travel on Paved Roads Construction Duration 22 days Paved Roads emission factors from AP-42, Section 13.2.1: Paved Roads (Final Section 1/11) E = k(sL)^0.91 \* (W)^1.02 where: E = Particulate emission factor k = 0.0022 lb/VMT [Table 13.2.1-1, particle size multiplier for PM10] k = 0.00054 lb/VMT [Table 13.2.1-1, particle size multiplier for PM2.5] sL = 0.6 [road surface silt loading (grams per square meter (g/m2)), Table 13.2.1-2] It is assumed that there is less than 500 average daily traffic to represent the project. W = 2 tons [weighted average vehicle weight] E (PM10) = 0.003 lb/VMT E (PM2.5) = 0.0006 lb/VMT 2015 Emissions (tons) Max Daily 2015 Total Max Daily Offsite Vehicle Onsite Vehicle Roundtrip 2015 2015 Total Vehicle Miles Traveled Miles PM10 PM2.5 Maximum Quantity per Roundtrip Vehicle Details Weight Distance per Duration on Paved Roads Traveled \* Emissions Emissions day Distance per (tons) Vehicle within (days) (VMT) Vehicle (tons) (tons) Vehicle general area Weight (miles/day) (miles/day) (tons) Dump Truck 20 1 0 6.375 22 140 2,805 0.00 0.00 Flatbed Truck 10 5 0 6.375 22 701 7,013 0.00 0.00 Staff & Security Truck 2.25 4 0 6.375 22 561 1,262 0.00 0.00 Pickup Truck 4 10 0 6.375 22 1,403 5,610 0.00 0.00 General Materials Delivery Truck 20 1 100 0 22 2,200 44,000 0.00 0.00 Water Delivery Truck 30 2 0 6.375 22 281 8,415 0.00 0.00 Worker Passenger Vehicles 1.25 50 100 0 22 110,000 137,500 0.14 0.03 Total 115,286 206,605 0.14 0.04 Weighted average vehicle weight (tons) 1.79 Notes: 1 - Decommission is assumed to last 1 month, from 7 a.m. to 7 p.m., Monday through Friday. 2 - The type of vehicle, the maximum quantity per day, vehicle weight, and Max Daily Offsite Roundtrip Distance per Vehicle within the general area (miles/day) were provided from the K Road Solar Project and modified into assumptions for decommissioning (i.e., 50 workers). 3 - Roundtrip mileage for Max Daily Onsite Roundtrip Distance per Vehicle (miles/day) is based on (1) information from draft EIS: 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15, and (2) the assumption that the distance per day = 5 miles per roundtrip (on 2.5-mile gravel access road) + 2.5 miles per roundtrip (distance traveled in and out on 1,000-acre site if site is 1.25 miles X 1.25 miles) = 7.5 miles per roundtrip. 4 - Per client, 85% of roads onsite (access roads) are paved.Moapa Solar Decommission - Fugitive Dust from Travel on Unpaved Roads Construction Duration 22 days Unpaved Roads emission factor from AP-42, Section 13.2.2: Unpaved Roads (11/06) a b E = [k(s/12) (W/3) ] where: s = 8.5 surface material silt content (%) [Table 13.2.2-1, Construction sites mean silt content %] W= 8 tons [weighted average vehicle weight] k= 1.5 lb/VMT [Table 13.2.2-2, for PM10 ] k= 0.15 lb/VMT [Table 13.2.2-2, for PM2.5] a= 0.9 constant [Table 13.2.2-2, for PM10 and PM2.5] b= 0.45 constant [Table 13.2.2-2, for PM10 and PM2.5] E (PM10)= 1.72 lb/VMT E (PM2.5)= 0.17 lb/VMT 2015 Emissions (tons) Vehicle 2015 2015 Total Vehicle Miles Traveled on PM10 PM2.5 Max Daily Onsite Roundtrip 2015 Total Vehicle Miles Vehicle Details Weight Maximum Quantity per day Duration Unpaved Roads Emissions Emissions Distance per Vehicle (miles/day) Traveled \* Vehicle Weight (tons) (tons) (days) (VMT) (tons) (tons) Dump Truck 20 1 1.125 22 25 495 0.02 0.00 Flatbed Truck 10 5 1.125 22 124 1,238 0.11 0.01 Staff & Security Truck 2.25 4 1.125 22 99 223 0.09 0.01 Pickup Truck 4 10 1.125 22 248 990 0.21 0.02 General Materials Delivery 20 1 0 22 0 0 0.00 0.00 Truck Water Delivery Truck 30 2 1.125 22 50 1,485 0.04 0.00 Worker Passenger Vehicles 1.25 50 0 22 0 0 0.00 0.00 Total 545 4,430 0.47 0.05 Weighted average vehicle wt (tons) 8.14 Notes: 1 - Decommissioning is assumed to last 1 month, from 7 a.m. to 7 p.m., Monday through Friday. 2 - The type of vehicle, maximum quantity per day, vehicle weight, and Max Daily Offsite Roundtrip Distance per Vehicle within the general area (miles/day) are provided from the K Road Solar Project and modified into assumptions for decommissioning (i.e. 50 workers). 3 - Roundtrip mileage for Max Daily Onsite Roundtrip Distance per Vehicle (miles/day) is based on (1) information from draft EIS: a 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15, and (2) the assumption that the distance per day = 5 miles per roundtrip (on a 2.5-mile gravel access road) + 2.5 miles per roundtrip (distance traveled in and out on a 1,000 acre site if the site is 1.25 miles X 1.25 miles) = 7.5 miles per roundtrip. 4 - According to the client, 85% of roads onsite (access roads) are paved, which means 15% are unpaved.Summary of CSP Construction Emissions

2014 Construction Emissions:

NOx: 11.77 tons

CO: 17.83 tons

SO2: 0.04 tons

VOC: 1.48 tons

PM10: 21.53 tons

PM2.5: 5.02 tons

Construction Equipment Exhaust: 5.53 tons of NOx, 3.35 tons of CO, 0.01 tons of SO2, 0.74 tons of VOC, 0.57 tons of PM10, 0.57 tons of PM2.5.

On-Road Vehicle Exhaust - Heavy Duty Vehicles: 3.22 tons of NOx, 1.27 tons of CO, 0.00 tons of SO2, 0.16 tons of VOC, 0.19 tons of PM10, 0.17 tons of PM2.5, 455.29 metric tons of CO2, 0.00 tons of N2O, 0.01 tons of CH4, 413.37 metric tons of CO2e, 0.03 tons of TOTAL HAP.

On-Road Vehicle Exhaust - Commute Vehicles: 3.01 tons of NOx, 13.21 tons of CO, 0.03 tons of SO2, 0.58 tons of VOC, 0.21 tons of PM10, 0.12 tons of PM2.5, 1709.90 metric tons of CO2, 0.02 tons of N2O, 0.03 tons of CH4, 1556.94 metric tons of CO2e, 0.17 tons of TOTAL HAP.

Fugitive Dust from Travel on Paved Roads: 5.39 tons of PM10, 1.32 tons of PM2.5.

Fugitive Dust from Travel on Unpaved Roads: 2.79 tons of PM10, 0.28 tons of PM2.5.

Fugitive Dust from Construction Activities: 12.38 tons of PM10, 2.56 tons of PM2.5.

Total: 11.77 tons of NOx, 17.83 tons of CO, 0.04 tons of SO2, 1.48 tons of VOC, 21.53 tons of PM10, 5.02 tons of PM2.5, 2,165 metric tons of CO2, 0.02 tons of N2O, 0.04 tons of CH4, 1,970 metric tons of CO2e, 0.20 tons of TOTAL HAP.

2015 Construction Emissions:

NOx: 21.08 tons

CO: 32.76 tons

SO2: 0.08 tons

VOC: 2.67 tons

PM10: 18.27 tons

PM2.5: 4.74 tons

Construction Equipment Exhaust: 9.74 tons of NOx, 5.86 tons of CO, 0.01 tons of SO2, 1.34 tons of VOC, 0.97 tons of PM10, 0.97 tons of PM2.5.

On-Road Vehicle Exhaust - Heavy Duty Vehicles: 5.91 tons of NOx, 2.36 tons of CO, 0.01 tons of SO2, 0.30 tons of VOC, 0.36 tons of PM10, 0.31 tons of PM2.5, 907.17 metric tons of CO2, 0.00 tons of N2O, 0.02 tons of CH4, 823.64 metric tons of CO2e, 0.06 tons of TOTAL HAP.

On-Road Vehicle Exhaust - Commute Vehicles: 5.43 tons of NOx, 24.54 tons of CO, 0.06 tons of SO2, 1.03 tons of VOC, 0.41 tons of PM10, 0.23 tons of PM2.5, 3357.99 metric tons of CO2, 0.03 tons of N2O, 0.06 tons of CH4, 3056.64 metric tons of CO2e, 0.31 tons of TOTAL HAP.

Fugitive Dust from Travel on Paved Roads: 10.74 tons of PM10, 2.64 tons of PM2.5.

Fugitive Dust from Travel on Unpaved Roads: 5.57 tons of PM10, 0.56 tons of PM2.5.

Fugitive Dust from Construction Activities: 0.22 tons of PM10, 0.04 tons of PM2.5.

Total: 21.08 tons of NOx, 32.76 tons of CO, 0.08 tons of SO2, 2.67 tons of VOC, 18.27 tons of PM10, 4.74 tons of PM2.5, 4,265 metric tons of CO2, 0.04 tons of N2O, 0.08 tons of CH4, 3,880 metric tons of CO2e, 0.36 tons of TOTAL HAP.

Moapa Solar CSP Construction - Construction Equipment Exhaust

Expected Construction Start: 7/1/2014

Expected Construction End: 12/31/2015

2014 Construction Duration: 131 days, Mon-Fri, 12 hours/day

2015 Construction Duration: 261 days, Mon-Fri, 12 hours/day

2014 Construction Equipment Emission Factors (g/hp-hr):

Aerial Lifts Diesel: 5.77 NOx, 6.78 CO, 0.005 SOx, 1.776 VOC, 0.968 PM10, 0.968 PM2.5

Concrete/Industrial Saws Diesel: 4.25 NOx, 1.48 CO, 0.004 SOx, 0.253 VOC, 0.246 PM10, 0.246 PM2.5

Cranes Diesel: 2.86 NOx, 0.727 CO, 0.003 SOx, 0.227 VOC, 0.174 PM10, 0.174 PM2.5

Dumpers/Tenders Diesel: 5.58 NOx, 6.13 CO, 0.005 SOx, 1.528 VOC, 0.922 PM10, 0.922 PM2.5

Excavators Diesel: 2.19 NOx, 0.949 CO, 0.003 SOx, 0.187 VOC, 0.229 PM10, 0.229 PM2.5

Off-Highway Trucks Diesel: 1.53 NOx, 0.444 CO, 0.003 SOx, 0.151 VOC, 0.082 PM10, 0.082 PM2.5

Rough Terrain Forklifts Diesel: 3.90 NOx, 2.82 CO, 0.004 SOx, 0.316 VOC, 0.340 PM10, 0.340 PM2.5

Tractors/Loaders/Backhoes Diesel: 5.21 NOx, 5.44 CO, 0.005 SOx, 0.967 VOC, 0.797 PM10, 0.797 PM2.5

Total for 2014: 5.53 tons of NOx, 3.35 tons of CO, 0.007 tons of SOx, 0.736 tons of VOC, 0.567 tons of PM10, 0.567 tons of PM2.5

2015 Construction Equipment Emission Factors (g/hp-hr):

Aerial Lifts Diesel: 5.59 NOx, 6.32 CO, 0.004 SOx, 1.643 VOC, 0.907 PM10, 0.907 PM2.5

Concrete/Industrial Saws Diesel: 4.05 NOx, 1.23 CO, 0.004 SOx, 0.230 VOC, 0.197 PM10, 0.197 PM2.5

Cranes Diesel: 2.48 NOx, 0.647 CO, 0.003 SOx, 0.209 VOC, 0.156 PM10, 0.156 PM2.5

Dumpers/Tenders Diesel: 5.38 NOx, 5.59 CO, 0.004 SOx, 1.379 VOC, 0.849 PM10, 0.849 PM2.5

Excavators Diesel: 1.82 NOx, 0.797 CO, 0.003 SOx, 0.174 VOC, 0.192 PM10, 0.192 PM2.5

Off-Highway Trucks Diesel: 1.13 NOx, 0.274 CO, 0.003 SOx, 0.141 VOC, 0.045 PM10, 0.045 PM2.5

Rough Terrain Forklifts Diesel: 3.73 NOx, 2.54 CO, 0.004 SOx, 0.284 VOC, 0.294 PM10, 0.294 PM2.5

Tractors/Loaders/Backhoes Diesel: 5.00 NOx, 5.03 CO, 0.004 SOx, 0.879 VOC, 0.728 PM10, 0.728 PM2.5

Total for 2015: 9.74 tons of NOx, 5.86 tons of CO, 0.013 tons of SOx, 1.345 tons of VOC, 0.974 tons of PM10, 0.974 tons of PM2.5

Notes: According to the Project, construction of the SPGF, from site preparation and grading to commercial operation, is expected to take 18 months (mid-2014 to the end of 2015).Construction will generally occur between 7 a.m. and 7 p.m., Monday through Friday. Construction equipment emission factors developed using the EPA NONROAD model. Construction equipment number, type, and HP rating was assumed: A mid-range HP value was chosen for each equipment category.429 Moapa Solar CSP Construction - On-Road Vehicle Exhaust - Heavy Duty Vehicles Expected Construction Start 7/1/2014 Expected Construction End 12/31/2015 2014 Construction Duration 131 days 2015 Construction Duration 261 days 2014 Heavy Duty Vehicle Emission Factors (g/mi) 2014 Heavy Duty Vehicle Emissions (tons) Max Daily Max Daily Offsite Onsite Maximum Roundtrip Roundtrip Duration Heavy Duty Vehicle Details Quantity per Distance per NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 Distance per (days) day Vehicle within Vehicle general area (miles/day) (miles/day) Concrete Delivery Truck for General 2 80 0 131 12.6 4.96 0.01 0.62 0.75 0.66 0.290 0.114 0.000 0.014 0.017 0.015 Construction Dump Truck 1 0 7.5 131 12.6 4.96 0.01 0.62 0.75 0.66 0.014 0.005 0.000 0.001 0.001 0.001 Flatbed Truck 5 0 7.5 131 12.6 4.96 0.01 0.62 0.75 0.66 0.068 0.027 0.000 0.003 0.004 0.004 Staff & Security Truck 4 0 7.5 131 12.6 4.96 0.01 0.62 0.75 0.66 0.054 0.021 0.000 0.003 0.003 0.003 Pickup Truck 10 0 7.5 131 12.6 4.96 0.01 0.62 0.75 0.66 0.136 0.054 0.000 0.007 0.008 0.007 Road Preparation Materials Truck 10 15 0 131 12.6 4.96 0.01 0.62 0.75 0.66 0.272 0.107 0.000 0.014 0.016 0.014 General Materials Delivery Truck for General 1 100 0 131 12.6 4.96 0.01 0.62 0.75 0.66 0.182 0.072 0.000 0.009 0.011 0.009 Construction PV Module, Tracker, & Electrical component 12 100 0 131 12.6 4.96 0.01 0.62 0.75 0.66 2.178 0.859 0.002 0.108 0.131 0.114 Delivery Water Delivery Truck 2 0 7.5 131 12.6 4.96 0.01 0.62 0.75 0.66 0.027 0.011 0.000 0.001 0.002 0.001 Total 3.222 1.270 0.004 0.160 0.193 0.168 2014 Heavy Duty Vehicle 2014 Heavy Duty Vehicle Emissions (tons) Emission Factors (g/mi) Max Daily Max Daily Offsite Onsite Maximum Roundtrip CO2e Roundtrip Duration Heavy Duty Vehicle Details Quantity per Distance per CO2 N2O CH4 CO2 N2O CH4 (metric Distance per (days) day Vehicle within tons) Vehicle general area (miles/day) (miles/day) Concrete Delivery Truck for General 2 80 0 131 1776.3 0.004 0.03 41.040 0.000 0.001 Construction 37.26 Dump Truck 1 0 7.5 131 1776.3 0.004 0.03 1.924 0.000 0.000 1.75 Flatbed Truck 5 0 7.5 131 1776.3 0.004 0.03 9.619 0.000 0.000 8.73 Staff & Security Truck 4 0 7.5 131 1776.3 0.004 0.03 7.695 0.000 0.000 6.99 Pickup Truck 10 0 7.5 131 1776.3 0.004 0.03 19.238 0.000 0.000 17.47 Road Preparation Materials Truck 10 15 0 131 1776.3 0.004 0.03 38.475 0.000 0.001 34.93 General Materials Delivery Truck for General 1 100 0 131 1776.3 0.004 0.03 25.650 0.000 0.000 Construction 23.29 PV Module, Tracker, & Electrical component 12 100 0 131 1776.3 0.004 0.03 307.801 0.001 0.005 Delivery 279.46 Water Delivery Truck 2 0 7.5 131 1776.3 0.004 0.03 3.848 0.000 0.000 3.49 Total 455.290 0.001 0.008 413.368

430 Moapa Solar CSP Construction - On-Road Vehicle Exhaust - Heavy Duty Vehicles - Continued 2014 Heavy Duty Vehicle Emission Factors (g/mi) Max Daily Offsite Max Daily Roundtrip Onsite Distance Maximu Roundtrip per 1,3- Form- Acet- 2,2,4- Ethyl Propion- PAH (less Heavy Duty Vehicle m Distance Duratio Benzen Ethano MTB Acrolei Hexan Styren Toluen Xylen Naphthalen Vehicle e l E Butadien aldehyd aldehyd n Trimethyl Benzen e aldehyd e e e e Naphthalene Details Quantity per n (days) e e e -pentane e e ) within per day Vehicle general (miles/day area ) (miles/day ) Concrete Delivery Truck for 2 80 0 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 General Construction Dump Truck 1 0 7.5 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Flatbed Truck 5 0 7.5 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Staff & Security Truck 4 0 7.5 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Pickup Truck 10 0 7.5 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Road Preparation Materials 10 15 0 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Truck General Materials Delivery Truck for General 1 100 0 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Construction PV Module, Tracker, & Electrical component 12 100 0 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 Delivery Water Delivery Truck 2 0 7.5 131 0.007 0.002 0.000 0.002 0.046 0.021 0.004 0.003 0.003 0.003 0.002 0.001 0.010 0.009 0.005 0.003 2014 Heavy Duty Vehicle Emissions (tons) 1,3- Form- Acet- 2,2,4- Ethyl Propion- PAH (less Heavy Duty Vehicle Benzen Ethano MTB Acrolei Hexan Styren Toluen Xylen Naphthalen Total Butadien aldehyd aldehyd Trimethyl Benzen aldehyd Naphthalene Details e l E n e e e e e HAPs e e e -pentane e e ) Concrete Delivery Truck for 0.00 0.000 0.000 0.000 0.000 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 General Construction 3 0.00 Dump Truck 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 0.000 0 0.00 Flatbed Truck 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 0.000 1 0.00 Staff & Security Truck 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 0.000 1 0.00 Pickup Truck 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 0.000 1 Road Preparation Materials 0.00 0.000 0.000 0.000 0.000 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Truck 3 General Materials Delivery 0.00 Truck for General 0.000 0.000 0.000 0.000 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 2 Construction PV Module, Tracker, & 0.02 Electrical component 0.001 0.000 0.000 0.000 0.008 0.004 0.001 0.000 0.001 0.000 0.000 0.000 0.002 0.001 0.001 0.001 1 Delivery 0.00 Water Delivery Truck 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 0.000 0 0.03 Total 0.002 0.001 0.000 0.001 0.012 0.005 0.001 0.001 0.001 0.001 0.001 0.000 0.003 0.002 0.001 0.001 1

431 Moapa Solar CSP Construction - On-Road Vehicle Exhaust - Heavy Duty Vehicles - Continued 2015 Heavy Duty Vehicle Emission Factors (g/mi) 2015 Heavy Duty Vehicle Emissions (tons) Maximum Max Daily Offsite Roundtrip Max Daily Onsite Roundtrip Duration Heavy Duty Vehicle Details Quantity per Distance per Vehicle within general Distance per Vehicle NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 (days) day area (miles/day) (miles/day) Concrete Delivery Truck for General 2 80 0 261 11.57 4.61 0.01 0.58 0.70 0.602 0.533 0.212 0.001 0.027 0.032 0.028 Construction Dump Truck 1 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.025 0.010 0.000 0.001 0.002 0.001 Flatbed Truck 5 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.125 0.050 0.000 0.006 0.008 0.006 Staff & Security Truck 4 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.100 0.040 0.000 0.005 0.006 0.005 Pickup Truck 10 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.250 0.100 0.000 0.012 0.015 0.013 Road Preparation Materials Truck 10 15 0 261 11.57 4.61 0.01 0.58 0.70 0.602 0.499 0.199 0.001 0.025 0.030 0.026 General Materials Delivery Truck for 1 100 0 261 11.57 4.61 0.01 0.58 0.70 0.602 0.333 0.133 0.000 0.017 0.020 0.017 General Construction PV Module, Tracker, & Electrical 12 100 0 261 11.57 4.61 0.01 0.58 0.70 0.602 3.996 1.593 0.005 0.200 0.241 0.208 component Delivery Water Delivery Truck 2 0 7.5 261 11.57 4.61 0.01 0.58 0.70 0.602 0.050 0.020 0.000 0.002 0.003 0.003 Total 5.911 2.356 0.007 0.295 0.356 0.308 2015 Heavy Duty Vehicle 2015 Heavy Duty Vehicle Emissions Emission Factors (g/mi) (tons) Maximum Max Daily Offsite Roundtrip Max Daily Onsite Roundtrip CO2e Duration Heavy Duty Vehicle Details Quantity per Distance per Vehicle within general Distance per Vehicle CO2 N2O CH4 CO2 N2O CH4 (metric (days) day area (miles/day) (miles/day) tons) Concrete Delivery Truck for General 2 80 0 261 1776.44 0.003 0.03 81.773 0.000 0.002 Construction 74.24 Dump Truck 1 0 7.5 261 1776.44 0.003 0.03 3.833 0.000 0.000 3.48 Flatbed Truck 5 0 7.5 261 1776.44 0.003 0.03 19.165 0.000 0.000 17.40 Staff & Security Truck 4 0 7.5 261 1776.44 0.003 0.03 15.332 0.000 0.000 13.92 Pickup Truck 10 0 7.5 261 1776.44 0.003 0.03 38.331 0.000 0.001 34.80 Road Preparation Materials Truck 10 15 0 261 1776.44 0.003 0.03 76.662 0.000 0.001 69.60 General Materials Delivery Truck for 1 100 0 261 1776.44 0.003 0.03 51.108 0.000 0.001 General Construction 46.40 PV Module, Tracker, & Electrical 12 100 0 261 1776.44 0.003 0.03 613.295 0.001 0.011 component Delivery 556.83 Water Delivery Truck 2 0 7.5 261 1776.44 0.003 0.03 7.666 0.000 0.000 6.96 Total 907.165 0.002 0.017 823.642

432 Moapa SolarCSP Construction - On-Road Vehicle Exhaust - Heavy Duty Vehicles - Continued 2015 Heavy Duty Vehicle Emission Factors (g/mi) Max Daily Offsite Max Daily Roundtrip Onsite Distance Maximu Roundtrip Propion per Duratio 1,3- Form- Acet- 2,2,4- Ethyl PAH (less m Distance Benzen Ethano MTB Acrolei Hexan - Styren Toluen Xylen Naphthalen Heavy Duty Vehicle Details Vehicle n e l E Butadien aldehyd aldehyd n Trimethy Benzen e aldehyd e e e e Naphthalen Quantity per e e e l-pentane e e) within (days) e per day Vehicle general (miles/da area y) (miles/da y) Concrete Delivery Truck for General 0.00 2 80 0 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 Construction 0 0.00 Dump Truck 1 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 0.00 Flatbed Truck 5 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 0.00 Staff & Security Truck 4 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 0.00 Pickup Truck 10 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 0.00 Road Preparation Materials Truck 10 15 0 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 General Materials Delivery Truck for 0.00 1 100 0 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 General Construction 0 PV Module, Tracker, & Electrical 0.00 12 100 0 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 component Delivery 0 0.00 Water Delivery Truck 2 0 7.5 261 0.007 0.002 0.002 0.043 0.019 0.003 0.002 0.003 0.003 0.002 0.001 0.009 0.008 0.005 0.003 0 2015 Heavy Duty Vehicle Emissions (tons) Propion 1,3- Form- Acet- 2,2,4- Ethyl PAH (less Total Benzen Ethano MTB Acrolei Hexan - Styren Toluen Xylen Naphthalen Heavy Duty Vehicle Details e l E Butadien aldehyd aldehyd n Trimethy Benzen e aldehyd e e e e Naphthalen HAP e e e l-pentane e e) s e Concrete Delivery Truck for General 0.00 0.00 0.000 0.000 0.000 0.002 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 Construction 0 5 0.00 0.00 Dump Truck 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 0 0 0.00 0.00 Flatbed Truck 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 0 1 0.00 0.00 Staff & Security Truck 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 0 1 0.00 0.00 Pickup Truck 0.000 0.000 0.000 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0 2 0.00 0.00 Road Preparation Materials Truck 0.000 0.000 0.000 0.002 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0 5 General Materials Delivery Truck for 0.00 0.00 0.000 0.000 0.000 0.001 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 General Construction 0 3 PV Module, Tracker, & Electrical 0.00 0.03 0.002 0.001 0.001 0.015 0.007 0.001 0.001 0.001 0.001 0.001 0.000 0.003 0.003 0.002 0.001 component Delivery 0 9 0.00 0.00 Water Delivery Truck 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 0 0 0.00 0.05 Total 0.003 0.001 0.001 0.022 0.010 0.002 0.001 0.001 0.001 0.001 0.000 0.005 0.004 0.002 0.002 0 7

434 Moapa Solar CSP Construction - On-Road Vehicle Exhaust - Commute Vehicles Expected Construction Start 7/1/2014 Expected Construction End 12/31/2015 2014 Construction Duration 131 days 2015 Construction Duration 261 days 2014 Worker Commute Emission Factors (g/mi) 2014 Worker Commute Emissions (tpy) Max Daily Offsite Roundtrip Duration Worker Passenger Vehicles Distance per Vehicle within NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 (days) general area (miles/day) 0.00 300 100 131 0.695 3.05 0.134 0.048 0.028 3.012 13.210 0.031 0.581 0.209 0.119 7 2014 Worker Commute 2014 Worker Commute Emissions (tpy) Emission Factors (g/mi) Max Daily Offsite Roundtrip CO2e Duration Worker Passenger Vehicles Distance per Vehicle within CO2 N2O CH4 CO2 N2O CH4 (metric (days) general area (miles/day) tons) 394.71 0.00 1556.9 300 100 131 0.004 1709.897 0.019 0.033 2 8 4 2014 Worker Commute Emission Factors (g/mi) Max Daily Offsite Roundtrip 1,3- Form- Acet- 2,2,4- Ethyl Propion- PAH (less Duration Benzen Ethano MTB Hexan Styren Toluen Xylen Naphthalen Worker Passenger Vehicles Distance per Vehicle within e l E Butadien aldehyd aldehyd Acrolein Trimethyl Benzen e aldehyd e e e e Naphthalene (days) e e e -pentane e e ) general area (miles/day) 0.00 300 100 131 0.004 0.003 0.001 0.002 0.002 0.000 0.002 0.002 0.002 0.000 0.000 0.011 0.009 0.000 0.000 0 2014 Worker Commute Emissions (tons) 1,3- Form- Acet- 2,2,4- Ethyl Propion- PAH (less Benzen Ethano MTB Hexan Styren Toluen Xylen Naphthalen Total Worker Passenger Vehicles e l E Butadien aldehyd aldehyd Acrolein Trimethyl Benzen e aldehyd e e e e Naphthalene HAPs e e e -pentane e e ) 0.00 0.17 300 0.019 0.014 0.003 0.009 0.008 0.000 0.010 0.011 0.010 0.001 0.001 0.048 0.039 0.001 0.001 0 2

435 Moapa Solar CSP Construction - On-Road Vehicle Exhaust - Commute Vehicles - Continued 2015 Worker Commute Emission Factors (g/mi) 2015 Worker Commute Emissions (tpy) Max Daily Offsite Roundtrip Duration Worker Passenger Vehicles Distance per NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 (days) Vehicle within general area (miles/day) 300 100 261 0.629 2.84 0.007 0.120 0.047 0.027 5.433 24.535 0.060 1.033 0.407 0.230 2015 Worker Commute 2015 Worker Commute Emissions (tpy) Emission Factors (g/mi) Max Daily Offsite Roundtrip CO2e Duration Worker Passenger Vehicles Distance per CO2 N2O CH4 CO2 N2O CH4 (metric (days) Vehicle within tons) general area (miles/day) 300 100 261 389.064 0.004 0.007 3357.993 0.034 0.061 3056.64 2015 Worker Commute Emission Factors (g/mi) Max Daily Offsite Roundtrip 2,2,4- Duration 1,3- Form- Acet- Ethyl Propion- PAH (less Worker Passenger Vehicles Distance per Benzene Ethanol MTBE Butadiene aldehyde aldehyde Acrolein Trimethyl- Benzene Hexane aldehyde Styrene Toluene Xylene Naphthalene Naphthalene) (days) pentane Vehicle within general area (miles/day) 300 100 261 0.004 0.003 0.000 0.001 0.002 0.002 0.000 0.002 0.002 0.002 0.000 0.000 0.010 0.008 0.000 0.000 2015 Worker Commute Emissions (tons) 2,2,4- 1,3- Form- Acet- Ethyl Propion- PAH (less Total Worker Passenger Vehicles Benzene Ethanol MTBE Butadiene aldehyde aldehyde Acrolein Trimethyl- Benzene Hexane aldehyde Styrene Toluene Xylene Naphthalene Naphthalene) HAPs pentane 300 0.033 0.024 0.000 0.005 0.016 0.014 0.001 0.017 0.019 0.018 0.001 0.001 0.084 0.068 0.003 0.001 0.306 Notes: 1 - Per the Project, construction of the SPGF, from site preparation and grading to commercial operation, will be expected to take 18 months (mid-2014-end 2015).Construction will generally occur between 7 a.m. and 7 p.m., Monday through Friday. Emission factors were developed using MOVES. Worker commute emission factors are based on the default MOVES national mix of passenger cars and trucks for year 2014 traveling at an average speed of 35 mph. The number of worker passenger vehicles, and the Max Daily Offsite Roundtrip Distance per Vehicle within the general area (miles/day), is provided from the K Road Solar Project. Moapa Solar CSP Construction - Fugitive Dust from Travel on Paved Roads was expected to start construction on 7/1/20, with an expected end date of 12/31/2015. The 2014 construction duration was 131 days, and the 2015 construction duration was 261 days. Paved roads emission factors are from AP-42, Section 13.2.1: Paved Roads (Final Section 1/11) where the particulate emission factor (E) is represented by the formula E= k(sL)^0.91 \* (W)^1.02. In this formula: E is the particulate emission factor in lb/VMT [Table 13.2.1-1, particle size multiplier for PM10] with a value of 0.002 k. For PM2.5, k is 0.000 lb/VMT [Table 13.2.1-1, particle size multiplier for PM2.5], and road surface silt loading is 54 grams per square meter (g/m^2) [Table 13.2.1-2]. For sL, the assumed road surface silt loading is 0.6, with less than 500 average daily traffic to represent the project.W = 2 tons [weighted average vehicle weight] E (PM10) = 0.003 lb/VMT 0.000 E (PM2.5) = lb/VMT 6 2014 2015 Emissions Emissions (tons) (tons) Max Daily 2014 2014 Offsite Max Total Total 2015 Max Daily Vehicle Total Onsite Vehicle Miles Miles Total Vehicle Roundtrip Traveled Vehicle Miles Traveled PM10 PM2.5 PM10 PM2.5 Vehicle Distance Roundtrip Duration Duration on Paved Roads \* Traveled \* Emissions Emissions Emissions Emissions Details Weight Maximum Quantity per day per Distance (days) (days) Paved (VMT) Vehicle Vehicle (tons) (tons) (tons) (tons) Vehicle (miles Road Weight Weight general day) (tons) (tons) area /day) 20,960 419,200 835,200 Concrete Delivery Truck for General Construction 20 2 80 131 261 41,760 0.03 0.01 0.05 0.01 16,703 33,278 Dump Truck 20 1 6.375 131 261 835 1,664 0.00 0.00 0.00 0.00 41,756 83,194 Flatbed Truck 10 5 6.375 131 261 4,176 8,319 0.01 0.00 0.01 0.00 7,516 14,975 Staff & Security Truck 2.25 4 6.375 131 261 3,341 6,656 0.00 0.00 0.01 0.00 33,405 66,555 Pickup Truck 4 10 6.375 131 261 8,351 16,639 0.01 0.00 0.02 0.01 19,650 393,000 783,000 Road Preparation Materials Truck 20 10 15 131 261 39,150 0.03 0.01 0.05 0.01

438 Moapa Solar CSP Construction - Fugitive Dust from Travel on Unpaved Roads Expected Construction Start 7/1/2014 Expected Construction End 12/31/2015 2014 Construction Duration 131 days 2015 Construction Duration 261 days Unpaved Roads emission factor from AP-42, Section 13.2.2: Unpaved Roads (11/06) a b E = [k(s/12) (W/3)] where: s = 8.5 surface material silt content (%) [Table 13.2.2-1, Construction sites mean silt content %] W = 8 tons [weighted average vehicle weight] k = 1.5 lb/VMT [Table 13.2.2-2, for PM10] k = 0.15 lb/VMT [Table 13.2.2-2, for PM2.5] a = 0.9 constant [Table 13.2.2-2, for PM10 and PM2.5] b = 0.45 constant [Table 13.2.2-2, for PM10 and PM2.5] E (PM10) = 1.72 lb/VMT E (PM2.5) = 0.17 lb/VMT 2014 Emissions (tons) 2015 Emissions (tons) 2014 Total 2014 Total 2015 Total Max Daily Vehicle Vehicle Vehicle Onsite Miles Vehicle 2014 2015 2015 Total Vehicle Miles Traveled Miles Miles PM10 PM2.5 PM10 PM2.5 Roundtrip Traveled Vehicle Details Weight Maximum Quantity per day Duration Duration on Unpaved Roads Traveled \* Traveled \* Emissions Emissions Emissions Emissions Distance per on (tons) (days) (days) (VMT) Vehicle Vehicle (tons) (tons) (tons) (tons) Vehicle Unpaved Weight Weight (miles/day) Roads (tons) (tons) (VMT) Concrete Delivery Truck for General Construction 20 2 131 261 0 0 0 0 0.00 0.00 0.00 0.00 Dump Truck 20 1 1.125 131 261 147 294 2,948 5,873 0.13 0.01 0.25 0.03 Flatbed Truck 10 5 1.125 131 261 737 1,468 7,369 14,681 0.63 0.06 1.26 0.13 Staff & Security Truck 2.25 4 1.125 131 261 590 1,175 1,326 2,643 0.51 0.05 1.01 0.10 Pickup Truck 4 10 1.125 131 261 1,474 2,936 5,895 11,745 1.27 0.13 2.53 0.25 Road Preparation Materials Truck 20 10 131 261 0 0 0 0 0.00 0.00 0.00 0.00 General Materials Delivery Truck for General Construction 20 1 131 261 0 0 0 0 0.00 0.00 0.00 0.00 PV Module, Tracker, & Electrical component Delivery 10 12 131 261 0 0 0 0 0.00 0.00 0.00 0.00 Water Delivery Truck 30 2 1.125 131 261 295 587 8,843 17,618 0.25 0.03 0.51 0.05 Worker Passenger Vehicles 1.25 300 131 261 0 0 0 0 0.00 0.00 0.00 0.00 Total 3,242 6,460 26,380 52,559 2.79 0.28 5.57 0.56 Weighted average vehicle weight (tons) 8.14 8.14 Notes: 1 - Per the Project, construction of the SPGF, from site preparation and grading to commercial operation, will be expected to take 18 months (mid-2014-end 2015).

The text you provided primarily consists of data tables and lists, with minimal narrative or pronouns that need coreference resolution. If there are specific parts you want further clarified or adjusted, please let me know!Construction will generally occur between 7 a.m. The type of heavy-duty vehicle, maximum quantity per day, vehicle weight, and Max Daily Offsite Roundtrip Distance per Vehicle within the general area (miles/day) are provided from the K Road Solar Project. "Moapa Solar CSP Construction - Fugitive Dust from Construction Activities 2014 Emissions Amount of Soil Area Disturbed PM10 Emission Factor PM10 Emissions Dust Control Efficiency PM10 PM2.5 Construction Activity Disturbed (acres) (lb/ton) (tons) (%) (tons) (tons) (tons) Access Road Construction 220 acres, 479,160 lb/ton, 0.058 tons, 13.90 % Efficiency, 50% Dust Control Efficiency, 6.95 tons PM10, 1.45 tons PM2.5 Parking and Laydown 110 acres, 119,790 lb/ton, 0.058 tons, 3.47 % Efficiency, 50% Dust Control Efficiency, 1.74 tons PM10, 0.36 tons PM2.5 Site Grading 220 acres, 239,580 lb/ton, 0.058 tons, 6.95 % Efficiency, 50% Dust Control Efficiency, 3.47 tons PM10, 0.72 tons PM2.5. Total 12.16 tons PM10, 2.53 tons PM2.5 2014 Emissions 2015 Emissions Amount of Soil Amount of Soil Amount of Soil Total Amount of Soil PM10 Emission Factor PM10 Emissions Dust Control Efficiency PM10 PM2.5 PM10 PM2.5 Construction Activity Excavated Excavated Backfilled (tons) (lb/ton) (tons) (%) (tons) (tons) (tons) (tons) cf (tons) (tons) Excavation 135,000 cf, 6,750 cf, 6,750 cf, 13,500 cf, 0.058 lb/ton, 0.39 tons, 50% Dust Control Efficiency, 0.10 tons PM10, 0.01 tons PM2.5, 0.10 tons PM10, 0.01 tons PM2.5 Water Line Excavation 166,320 cf, 8,316 cf, 8,316 cf, 16,632 cf, 0.058 lb/ton, 0.48 tons, 50% Dust Control Efficiency, 0.12 tons PM10, 0.03 tons PM2.5, 0.12 tons PM10, 0.03 tons PM2.5. Total 0.22 tons PM10, 0.04 tons PM2.5, 0.22 tons PM10, 0.04 tons PM2.5 Grand Total 12.38 tons PM10, 2.56 tons PM2.5, 0.22 tons PM10, 0.04 tons PM2.5 Notes: Area disturbed for access road construction is assumed to be 20% of a 1,000-acre site, 10% for parking and laydown, and 20% for site grading. Depth disturbed for access road construction is assumed to be 12 inches, 6 inches for parking and laydown, and 6 inches for site grading. Access road construction, parking and laydown, and site grading are assumed to occur in 2014. The amount of soil disturbed uses a 100 lb/cf soil density and conversion of 43,560 sq ft = 1 acre. An assumption that can be made is 15,000 cf per mile of transmission line based on an average volume excavated from a recent transmission line project for 4.5 structures per mile of 345 kV double-circuit lattice tower and 5.5 structures per mile of 230 kV double-circuit tubular poles. Using information from the draft EIS, "Approximately 7.5 miles of single-circuit 230-kV overhead transmission line from the SPGF to the Harry Allen 230-kV Substation" and "Approximately 1.5 miles of single-circuit 500-kV overhead transmission line from the SPGF to the 500 kV Crystal Valley Substation" results in a total of 9 miles of transmission lines. 9 \* 15,000 cf per mile of transmission line is equal to 135,000 cf of soil excavated. Disturbance emission factors come from AP-42, Table 11.9-4 (dated 7/98), assuming 100% of TSP is PM10. PM10 emissions are conservatively assumed to be 100% of TSP. PM2.5 emissions were calculated following the SCAQMD Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology, October 2006. For construction and demolition fugitive dust sources, 20.8% of the PM10 would be PM2.5.6 - PM emissions are controlled by watering or use of other tackifier, control efficiency assumed to be 50%"

441 Summary of CSP Operational Emissions CO2e TOTAL NOx CO SO2 VOC PM10 PM2.5 CO2 N2O CH4 SF6 (metric HAP Operation Emission Category (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) (tons) tons) (tons) Paved Roads - - - - 0.58 0.14 - - - - - - Unpaved Roads - - - - 3.74 0.37 - - - - - - On-Road Vehicle Exhaust - Heavy Duty Vehicles 0.40 0.16 0.00 0.02 0.02 0.02 61.33 1.19E-04 1.14E-03 - 55.68 3.88E-03 On-Road Vehicle Exhaust - Commute Vehicles 0.72 3.27 8.07E-03 0.14 0.05 0.03 447.73 4.59E-03 8.09E-03 - 407.55 0.04 Circuit Breaker SF6 Emissions - - - - - - - - - 0.005 97.55 - Wet Cooling Tower - - - - 4.60 0.03 - - - - - - Diesel Fire-Pump Emissions 0.20 0.05 0.01 1.76E-02 0.02 0.02 8.21 0.02 0.01 - 7.47 5.02E-04 Diesel Generator Emissions 0.59 0.14 0.04 5.08E-02 0.05 0.05 23.68 0.06 0.02 - 21.56 1.45E-03 Total 1.92 3.62 0.07 0.23 9.05 0.66 540.95 0.08 0.04 4.50E-03 589.82 0.05

443 "Moapa Operation Emissions - Cooling Tower PM10/PM2.5 Calculation Water Circulation Rate (Q) 7000 gpm (Evaporation + Other Losses [leaks, drift, etc]) / Other Cycles of Concentration 10 Losses mg/l or ppmw - relative to ""clean"" make up water added to circulating TDS in Make Up 500 water HAP/TAP Concentration 0 mg/l or ppmw - typically metals or biocides Number of cells (outlet fans) 6 Drift Rate 0.0200 percent of Water Circulation Rate PM10 Fraction 0.30 see worksheet ""Cool-Tow-PM-Spec"" PM2.5 Fraction 0.0018 see worksheet ""Cool-Tow-PM-Spec"" TDS in Circulation 500 mg \* 10 cycles = 5,000 mg l l Recirculating Rate Conversions 7,000 gal \* 60 min = 420,000 gal min hr hr 420,000 gal \* 8.34 lb = 3,502,800 lb hr gal hr Total Drift Calculation 3,502,800 lb recirc \* 0.0200 lb drift = 700.56 lb drift hr 100 lb recirc hr Drift Particulate Matter Calculation (TDS = 5,000 ppm) 700.56 lb drift \* 5,000 lb PM = 3.50 lb PM hr 1,000,000 lb drift hr Calculated PM10 Fraction 29.97%"

444 3.50 lb PM \* 0.2997 = 1.050 lb PM10 hr hr 0.175 lb PM10 per cell hr 1.05 lb PM \* 8,760 hr-ton = 4.598 ton PM10 hr 2000 yr-lb yr Calculated PM2.5 Fraction 0.18% 3.50 lb PM \* 0.0018 = 0.006 lb PM2.5 hr hr 0.001 lb PM2.5 per cell hr ton 0.006 lb PM \* 8,760 hr-ton = 0.027 PM2.5 hr 2000 yr-lb yr HAP/TAP Emissions 0.00% 3.50 lb PM \* - ppmw = - HAP/TAP hr 500 ppmw hr - lb PM \* 8,760 hr-ton = - HAP/TAP hr 2000 yr-lb yr

445 "Moapa Operation Emissions - Cooling Tower PM10/PM2.5 Calculation - Continued TDS= 5,000 mg/l EPRI Droplet Droplet Solid Particle Solid Particle PM10 % PM2.5 % Diameter Volume ( mu m3 Droplet Mass Particle Mass Volume ( mu m3 Diameter EPRI % Mass Mass Mass ( mu m) [1] ) ( mu g) (Solids) ( mu g) ) ( mu m) Smaller [1] Smaller Smaller 10 524 5.24E-04 2.62E-06 1.19 1.31 0 0.177 20 4189 4.19E-03 2.09E-05 9.52 2.63 0.196 30 14137 1.41E-02 7.07E-05 32.13 3.94 0.226 40 33510 3.35E-02 1.68E-04 76.16 5.26 0.514 50 65450 6.54E-02 3.27E-04 148.75 6.57 1.816 60 113097 1.13E-01 5.65E-04 257.04 7.89 5.702 70 179594 1.80E-01 8.98E-04 408.17 9.20 21.348 29.971 90 381704 3.82E-01 1.91E-03 867.51 11.83 49.812 110 696910 6.97E-01 3.48E-03 1583.89 14.46 70.509 130 1150347 1.15E+00 5.75E-03 2614.42 17.09 82.023 150 1767146 1.77E+00 8.84E-03 4016.24 19.72 88.012 180 3053628 3.05E+00 1.53E-02 6940.06 23.67 91.032 210 4849048 4.85E+00 2.42E-02 11020.56 27.61 92.468 240 7238229 7.24E+00 3.62E-02 16450.52 31.55 94.091 270 10305995 1.03E+01 5.15E-02 23422.72 35.50 94.689 300 14137167 1.41E+01 7.07E-02 32129.92 39.44 96.288 350 22449298 2.24E+01 1.12E-01 51021.13 46.02 97.011 400 33510322 3.35E+01 1.68E-01 76159.82 52.59 98.34 450 47712938 4.77E+01 2.39E-01 108438.50 59.16 99.071 500 65449847 6.54E+01 3.27E-01 148749.65 65.74 99.071 600 113097336 1.13E+02 5.65E-01 257039.40 78.89 100 Data from ""Calculating Realistic PM10 Emissions from Cooling Towers"""

446 Moapa Operation Emissions - Cooling Tower PM10/PM2.5 Calculation - Continued Assumed data for cooling tower water use total groundwater use (from DEIS) 800 ac-ft/yr 3.26E+05 gal/ac-ft 2.61E+08 gal/yr 496.042618 gal/min percent of total for cooling tower makeup water 75% makeup water 372.031963 gal/min cycles of concentration 10 blowdown 37.2031963 gal/min evaporation 334.828767 gal/min evaporation percent of recirculating flow 5% recirculating flow 6696.57534 gal/min USGS groundwater data for local wells TDS (mg/l [ppm]) Well BW-01 608 Well SHV-01 478

457 Moapa Solar Operation - On-Road Vehicle Exhaust - Commute Vehicles Annual Operation 261 days 2015 Worker Commute Emission Factors (g/mi) Annual Worker Commute Emissions (tpy) Max Daily Offsite Roundtrip Duration Worker Passenger Vehicles Distance per Vehicle within NOx CO SOx VOC PM10 PM2.5 NOx CO SOx VOC PM10 PM2.5 (days) general area (miles/day) 40 100 261 0.629 2.84 0.007 0.120 0.047 0.027 0.724 3.271 0.008 0.138 0.054 0.031 2015 Worker Commute Annual Worker Commute Emissions Emission Factors (g/mi) (tpy) Max Daily Offsite Roundtrip CO2e Duration Worker Passenger Vehicles Distance per Vehicle within CO2 N2O CH4 CO2 N2O CH4 (metric (days) general area (miles/day) tons) 40 100 261 389.064 0.004 0.007 447.732 0.005 0.008 407.55 2015 Worker Commute Emission Factors (g/mi) Max Daily Offsite Roundtrip 2,2,4- Duration 1,3- Form- Acet- Ethyl Propion- PAH (less Worker Passenger Vehicles Distance per Vehicle within Benzene Ethanol MTBE Butadiene aldehyde aldehyde Acrolein Trimethyl- Benzene Hexane aldehyde Styrene Toluene Xylene Naphthalene Naphthalene) (days) pentane general area (miles/day) 40 100 261 0.004 0.003 0.000 0.001 0.002 0.002 0.000 0.002 0.002 0.002 0.000 0.000 0.010 0.008 0.000 0.000 Annual Worker Commute Emissions (tons) 2,2,4- 1,3- Form- Acet- Ethyl Propion- PAH (less Total Worker Passenger Vehicles Benzene Ethanol MTBE Butadiene aldehyde aldehyde Acrolein Trimethyl- Benzene Hexane aldehyde Styrene Toluene Xylene Naphthalene Naphthalene) HAPs pentane 40 0.004 0.003 0.000 0.001 0.002 0.002 0.000 0.002 0.003 0.002 0.000 0.000 0.011 0.009 0.000 0.000 0.041 Notes: 1 - Operation assumed to be 7 a.m. and 7 p.m., Monday through Friday.2 - Emission factors developed using MOVES. Year 2015 was used. 3 - Worker commute emission factors are based on the default MOVE's national mix of passenger cars and trucks for the year 2015 traveling at an average speed of 35 mph. 4 - The type of vehicle, maximum quantity per day, and Max Daily Offsite Roundtrip Distance per Vehicle within the general area (miles/day) were provided from the K Road Solar Project and modified into assumptions for operation. 458 Appendix M Raven Control Plan 459 Draft Raven Control Plan Moapa Solar Energy Center August 2013 460 Table of Contents 1. 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References ............................................................................................................................................... 15 461 List of Acronyms and Abbreviations ACEC Area of Critical Environmental Concern APLIC Avian Power Line Interaction Committee BIA Bureau of Indian Affairs BLM Bureau of Land Management CORA Common Raven I-15 Interstate 15 kV Kilovolt MBTA Migratory Bird Treaty Act Mph Miles per Hour MW Megawatt NDOW Nevada Division of Wildlife RCP Raven Control Plan ROW Right of way SPGP Solar Power Generation Plant USFWS U.S. Fish and Wildlife Service 462 1. Introduction 1.1 Background Moapa Solar Power, LLC (Moapa Solar) proposed to construct and operate the Moapa Solar Energy Center (MSEC). The Moapa Solar Energy Center will include a variety of major components, including the Solar Power Generating Facility (SPGF), an onsite substation, a Gen-Tie transmission line, a water pipeline, and an access road. The proposed project site is in Clark County, Nevada approximately 20 miles northeast of Las Vegas, Nevada. The Moapa Solar Energy Center would be located on 850 acres of leased land on the Moapa River Indian Reservation. The associated Gen-Tie Lines and access road would occur on lands administered by the Tribe and by the Bureau of Land Management (BLM). The proposed water pipeline would be located on Tribal lands with a portion of the water pipeline located within a designated utility corridor administered by the BLM. This Raven Control Plan (RCP) addresses activities that will occur during construction and operation of the Moapa Solar Power project regarding control of ravens as a nuisance species. Unless otherwise noted, the construction and operation activities and best management practices described in this Raven Control Plan apply to all components of the Moapa Solar Power project. The desert tortoise (Gopherus agassizii) is a federally-listed threatened species known to occur in and proximal to the project area. The proposed project area is not located in designated Critical Habitat for the desert tortoise or in any BLM Area of Critical Environmental Concern (ACEC). This Raven Control Plan has been developed as a mitigation measure to reduce the effects of 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, and increased availability of water sources and Moapa Solar Power project operation. This Raven Control Plan lists procedures to follow for the protection of wildlife species, such as the desert tortoise, from predation by other species that may be attracted to the Moapa Solar Power project as a result of construction or operation activities. This Raven Control Plan is being submitted to the Bureau of Land Management (BLM), Nevada Division of Wildlife (NDOW), 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 Raven Control Plan for the entire Moapa Solar Power project.Avian predators such as Common Ravens (CORA), loggerhead shrikes (Lanius ludovicianus), and American kestrels (Falco sparverius) may be drawn to the Project Area (the solar electric power generating facility and the Gen-Tie Line) due to the increase in food sources such as garbage cans and nesting/perching areas such as the site perimeter fence and Gen-Tie Line structures. While the solar generating facility site does not provide habitat for the Desert tortoise, occupied habitat for the desert tortoise is located close to the solar electric power generating facility and within the access roads and the Gen-Tie Line alignments on BLM-managed land. Avian predators drawn to the Project site 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 Raven Control Plan (RCP) is intended to reduce this potential impact.

1.2 Purpose of this Plan

The purpose of this Raven Control Plan 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 area. This includes, but is not limited to, collecting and disposing of all litter and trash found or produced at the solar facility and along the Gen-Tie Line route as well as limiting the availability of water. All employees will be familiar with the Raven Control Plan, and littering will not be permitted. The project proponent and the project proponent's approved contractors would be responsible for implementing aspects of this Raven Control Plan. This Raven Control Plan is applicable to the construction and operation of the proposed project.

1.3 Project Description

1.2.1 Project Area

The Proposed Project would be located approximately 20 miles northeast of Las Vegas in Clark County, Nevada (Figure 1). The main project site, including the Solar Power Generating Facility (SPGF), would be located on 850 leased acres within the Reservation in Mount Diablo Meridian, Township 16 South, Range 64 East, Sections 29, 30, 31, and 32. Portions of the Gen-Tie Lines and access road would be located on lands administered by the Tribe and BLM. A water pipeline associated with the Project would be located on Reservation lands north and east of the Solar Power Generating Facility. Figure 2 shows the location of the Proposed Project and associated facilities. The proposed project 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 of the province are visible at the proposed project site, with nearly parallel mountain ranges on the western and eastern sides of the project site and a broad and gently sloping valley between. The proposed project site occurs in the Mojave Desert Scrub biome and is dominated by plants common to this biome including creosote bush (Larrea tridentata), and white bursage (Ambrosia dumosa).

1.2.2 Proposed Project

The following sections describe the major features of the proposed project. For a comprehensive description of the proposed project, refer to the associated environmental impact statement (EIS).

Solar Power Generation Facility

The Solar Power Generating Facility would be located wholly on lands within the Reservation. The Solar Power Generating Facility would be developed using photovoltaic (PV) technology and would generate up to 200 Megawatts (MWs) of energy.

Onsite Substation

A substation with medium voltage (12.5-kV or 34.5-kV) to high voltage (230-kV/500-kV) step-up transformer(s) with mineral oil, breakers, buswork, protective relaying, supervisory control and data acquisition (SCADA), and associated substation equipment would be located on the project site. The substation will be fenced for safety per 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 or below ground fiber optic cable or microwave tower. The project will be interconnected to the regional transmission system from this on-site substation/switchyard via the Gen-Tie interconnections described in the subsection below.

Gen-Tie Transmission Line and Interconnections

The construction of a new transmission line is necessary to deliver the power generated by the proposed project to the electrical grid. One or two Gen-Tie transmission lines will be constructed based on the customer for the power generated at the Solar Power Generating Facility. The customer will determine whether the power generated by the Solar Power Generating Facility will be delivered to either the Harry Allen Substation (via a 230 kV transmission line) or the Crystal Substation (via a 500 kV transmission line) as different entities can be accessed from each location.The 230 kV or 500 kV transmission line will originate at the Project substation located on the SPGF site. The Gen-Tie Lines would consist of the following: Approximately 7.1 miles of single-circuit 230-kV overhead transmission line from the SPGF to the Harry Allen 230-kV Substation and approximately 1.6 miles of single-circuit 500-kV overhead transmission line from the SPGF to the 500 kV Crystal Valley Substation. The 230 kV-line to Harry Allen would head south from the SPGF site for approximately 2.5 miles until meeting an existing 500-kV transmission line. The proposed transmission line would then follow, on the north side, the existing transmission line for approximately 3.8 miles and then stay north of the Harry Allen 500-kV Substation. Approximately 0.3 mile past the Harry Allen 500-kV Substation, the proposed line would cross an existing 500-kV transmission line at a 90-degree angle and proceed for another 0.4 mile before turning northeast and connecting into the Harry Allen 230-kV Substation on the north side of the Harry Allen 230-kV Substation. This route is approximately 7.1 miles long. The maintenance road associated with the existing 500 kV line will be used to the extent possible for construction and maintenance of the proposed 230 kV transmission line. The design, construction, operation, and maintenance of the transmission lines will 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 will 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 Avian Power Line Interaction Committee's more recent publication ""Reducing Avian Collisions with Power Lines (APLIC 2012).

Access Road The Project would require vehicular access for construction, operation, and maintenance. A 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15 would be constructed on BLM-administered lands. From the existing paved frontage road west of I-15, the proposed site access road would follow an existing dirt road for approximately 2.0 miles until the proposed site access road reaches the proposed 230 kV Gen-Tie transmission line ROW which the proposed site access road would follow approximately 0.5 mile north to the SPGF site. The access road would be designed to accommodate equipment deliveries, the construction workforce, and, ultimately, the operational needs of the Project. The surface of the access road is proposed to be 24 feet wide, would be two lanes, and would have adjacent shoulders and drainage swales on either side. The Applicant has requested a 100-foot-wide ROW so the existing road can be straightened if needed in some places. Final design for the access road would be consistent with BLM and Clark County road standards. The access road would be maintained as a component of the Project.

Fire Prevention The Project's fire protection water system will be supplied from a dedicated raw water storage tank, holding a minimum of 2-hours of full flow runtime, located on the SPGF. One electric and one diesel-fueled backup firewater pump will be installed to deliver water to the fire protection water-piping network. Fire protection pump flowrates will be in accordance with applicable standards. A smaller electric motor-driven jockey pump will maintain pressure in the piping network. If the jockey pump is unable to maintain a set operating pressure in the piping network, a main fire protection pump starts automatically. All fire protection system pumps must be shut off manually. The piping network will 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 will be located throughout the plant site.

Raven Management 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 Moapa SPGF and along the Gen-Tie Line. Implementing the raven management measures will be the responsibility of the Project owner. 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 Resources 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 town of Las Vegas provides a consistent local source of food for ravens. Project construction activities and the Gen-Tie structures are likely to attract ravens. To prevent the addition of food and water subsidies, as well as to avoid attracting ravens to the Project site, the Applicant will implement the following measures. 2.2.1 Garbage Management All garbage associated with the Project 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 pickup. 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 site. The Worker Environmental Education program will inform project personnel that project personnel are prohibited from intentionally feeding ravens and will explain why feeding wildlife is detrimental to wildlife, including sensitive species, in and around the Project site. 2.2.3 Limit Availability of Water Water is a valuable resource in the desert and predictably limited during the late spring and summer. Unnatural water sources such as evaporation ponds and retention basins have the potential to facilitate 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, operation, maintenance, and decommissioning, water will be used in a manner that does not result in ponding or puddling, excluding evaporation ponds and stormwater detention/retention basins, which will be designed to eliminate standing water within the basins within several days after even the worst expected storm events. 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 discourages ponding or puddling. If PV module washing is necessary, PV module washing will be conducted in a manner that avoids ponding or puddling of water during times that ravens are active, which are the early morning and later afternoon hours. During construction and operations and maintenance, project personnel will immediately remove areas of ponding or puddling water. The Proposed Project includes evaporation ponds that will collect wastewater from the water treatment system. The addition of a new water source to an area where water sources are sparse may result in the attraction of ravens to the Project area. Evaporation ponds may collect rainwater during the construction phase, which could serve as an attractant to ravens. Monitoring will evaluate the presence of ravens during construction. If ravens are identified in the evaporation ponds, hazing will be employed to discourage use. Because the ponds need to remain uncovered to maximize evaporation rates, completely covering the ponds is not a preferred option. However, a series of avian deterrence measures are being incorporated into the design and operation of the evaporation ponds in order to discourage access to the ponds by ravens. The operational design of the ponds would include a minimum depth of 2 feet and a minimum freeboard of 2 feet. If water needs to be rerouted to specific ponds in order to maintain a 2-foot minimum depth, the remaining ponds would be pumped dry. In addition, the interior sides of the ponds would be relatively steep at a 33 percent slope (3:1, horizontal: vertical). Netting of the ponds may also be implemented if other design measures do not prove to be effective. Other options for preventing use of these ponds by ravens include the use of anti-perching devices placed at strategic locations along the perimeter of the ponds in order to exclude ravens and other birds from accessing the edge of the ponds. 2.3 Prevent Nesting To prevent nesting on Project structures, the Applicant will implement the following measures: 1. Limiting Raptor Enhancement Measures. Utility pole and tower construction will not include raptor-friendly designs or retrofits (outlined in the Avian Power Line Interaction Committee guidelines [APLIC 2006]) that are intended to encourage or enhance the potential for raptor nests that could also be used by ravens. 2. Utility and building structures.Acquire a MBTA Depredation Permit in order to remove any raven nests that are found on project structures. Raven nest removal will be at the direction of the Project's Designated Biologist, in cooperation with U.S. Fish and Wildlife Service (USFWS), BLM and the Nevada Department of Wildlife (NDOW). 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 hazing is considered the best course of action. 4. Structure removal following decommission. Elevated structures including utility poles will be removed when these utility poles are decommissioned and dormant. 5. Perch deterrents. To reduce perching along segments of the transmission line, perch deterrents would 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 line. 6. Annual inspections. Inspections of lines and other areas where raptor or corvids (crows and ravens) might nest along the transmission lines would be conducted annually. Non-active nests are not protected by MBTA, and non-active nest 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. 2.4 Discourage Roosting Power poles and towers typically associated with transmission line structures can provide roosting opportunities in areas where roosting opportunities are otherwise limited. Elevated roost locations offer ravens a view of ravens' surroundings and prey below. If ravens are strongly attracted to the Project site by available food and/or water sources, it will be difficult to eliminate or control raven 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 raven perching on the Project site or Gen-Tie Lines, ravens attracted to the area will likely find other perching opportunities immediately adjacent to the Project site. Anti-perching activities, therefore, are more focused on preventing activities that will attract ravens to the Project vicinity (Boarman 2002), which include: cent 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 and Gen-Tie Lines will be monitored to identify frequently used line/tower perching locations for CoRA. Contingency measures will be implemented on a case-by-case basis, in consultation with BLM, when it becomes apparent that a particular structure is providing a favorable location for daytime perches or evening roosting. This could include, for example, installation of triangles, plastic owls, and/or spikes to discourage nesting, per the APLIC Guidelines (APLIC 2006). cent Structure removal following decommissioning. All Project-related elevated structures, including the Gen-Tie Line towers, will be removed when the Project is decommissioned. 471 3. Raven Monitoring and Reporting 3.1 Monitoring Raven monitoring will be conducted following the construction of the Gen-Tie Line and prior to completion of the SPGF. The objective of the raven monitoring surveys will be to characterize raven presence in the Project vicinity and to monitor raven abundance and behavior in those areas over time. The purpose of the raven monitoring surveys will be to identify the local sources of human-created resources and raven activity relative to the Project. The investigation will consist of driving surveys of the SPGF and the nearby Gen-Tie Line corridors. The roads will be driven slowly (10 mph). Binoculars and spotting scopes will be used to observe raven activity within two kilometers of the site. 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. Raven monitoring survey visits will occur once monthly both during the breeding season (March to July) and the remainder of the year (August to February) for one year following construction. Each raven monitoring survey visit will consist of a two-day effort. Each day the raven monitoring 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 within the Gen-Tie Line ROW, the raven or other avian scavenger nest will be monitored for sign 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 sign of predation will be mapped and photographed. 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 site 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.

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

472 Observations of raven predation of desert tortoise (including sign) and occupied raven nests will be reported to the designated contacts at the BIA, BLM, NDOW, 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 Project owner, 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.

473 4. 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. APLIC. 2012. Reducing Avian Collisions with Power Lines. The State of the Art in 2012. Washington, D.C. and Sacramento, CA: Edison Electric Institute and Avian Power Line Interaction Committee 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. Boarman, W. I. 2003. Managing a subsidized predator population: reducing common raven predation on desert tortoises. Environmental Management. 32:205-217. 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.

474 Appendix N Biological Assessment

478 Biological Assessment for the Moapa Solar Energy Center July 2013

479 "Introduction MSEC Biological Assessment 1 Introduction This Biological Assessment (BA) has been prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (ESA; 16 United States Code [U.S.C.] 1536(c)) to address potential effects associated with the construction, operation, decommissioning of a solar power generation facility and associated infrastructure known as the Moapa Solar Energy Center (MSEC or Proposed Action) on federally listed threatened and endangered species and their designated critical habitat. This Biological Assessment addresses the potential effects associated with the construction, operation, and maintenance of the Proposed Action on the desert tortoise (Gopherus agassizii; a federally threatened species) and the Moapa dace (Moapa coriacea; a federally endangered species). The Bureau of Indian Affairs (BIA) is the lead federal agency for National Environmental Policy Act (NEPA) compliance and an Environmental Impact Statement (EIS) is being prepared concurrent with this Biological Assessment. The Bureau of Land Management (BLM) is a cooperating agency on the Environmental Impact Statement along with the Environmental Protection Agency (EPA), National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), and the Tribe. The Moapa Solar Energy Center site was selected due to the Moapa Solar Energy Center site's high solar insolation, relatively flat terrain, and contiguous acreage in close proximity to existing infrastructure.Facilities located within the solar power generation facility (SPGF) boundary would occupy a footprint of approximately 850 acres and would utilize photovoltaic (PV) technology to generate up to 200 MWs of energy. The Project site would include the PV solar field, an office and maintenance building, parking area, lay-down area, switchyard, and a wastewater evaporation/detention pond. The Proposed Action would also include a site access road, one or two gen-tie transmission lines, and a water pipeline.

1.1 Purpose and Need

1.1.1 Purpose of the Proposed Action

Moapa Solar LLC (Moapa Solar LLC) has entered into an agreement with the Moapa Band of Paiutes Indians (Tribe) to lease land, up to 30 years, on the Moapa River Indian Reservation (Reservation) for the purposes of constructing and operating a solar generating facility and associated infrastructure (the MSEC). The Moapa Band of Paiutes Indians is federally recognized and has a Constitution approved by the Secretary of the Interior on April 17, 1942. The tribal lands originally set aside in 1874 consisted of two million acres; in 1876 the area was reduced to a thousand acres. Then, in December 1980, Congress added approximately 70,000 acres to the Tribal land base. The current total land base is 71,954 acres and is held in trust by the U.S. government for the Moapa Band of Paiutes Indians.

The Proposed Action would generate electricity using photovoltaic (PV) technology and would generate up to 200 megawatts (MW) of energy. The Proposed Action would have impacts to resources on the Reservation and on Bureau of Land Management (BLM) land (for rights-of-way). The 850-acre solar generation facility would be wholly within the Reservation. The ROW impacts on BLM land include up to two transmission lines (230 kV and/or a 500 kV) and an access road.

The Proposed Project is dependent upon approval by the Bureau of Indian Affairs (BIA). Pursuant to 25 U.S.C. 415, the BIA must approve the solar energy ground lease and associated ROW agreements for the transmission line (500kV) and water pipeline on Reservation land between the Moapa Band of Paiutes Indians and Moapa Solar LLC (BIA's Proposed Action).

BLM's purpose and need for the Proposed Project is to respond to the Moapa Solar LLC's application under Title V of the Federal Land Policy and Management Act (FLPMA) (43 U.S.C. 1761(a)) for ROW grants to construct, operate, maintain, and decommission electric transmission line(s), water pipeline, and access road ROWs on BLM-administered land and Reservation land (BLM ROW application N-88870). These ROWs would be in compliance with FLPMA, BLM ROW regulations, and other applicable federal law (BLM Proposed Action). The water pipeline and a portion of the 500 kV line would lie partially within the existing utility corridor managed by BLM but located on the Reservation. This portion of the utility corridor on Reservation land is administered by the BLM in accordance with P.L. 96-491 (the Moapa Utility Corridor and the Moapa Act) and reserved to the BLM under Public Law 96-491-Dec. 2, 1980. The portion of the water pipeline within an existing utility corridor on the Reservation but managed by BLM includes about 4.7 miles and the portion of the 500 kV line to the Crystal substation on Reservation lands includes approximately 1.0 miles.

The BLM Proposed Action also includes BLM approval of the ROW grants under Title V of the Federal Land Policy Management Act (FLPMA) to construct, operate, maintain and terminate the proposed electric transmission lines and access road pursuant to 43 CFR 2800 for the transmission lines and access road on federal lands managed by BLM (also part of BLM ROW application N-88870). The transmission lines would include a 230 kV line crossing about 6.9 miles of BLM land from the Project site to the Harry Allen substation and a 500 kV line that would cross about 0.4 miles of BLM land to the Crystal substation. The proposed access road would cross about 2.4 miles of BLM-administered land connecting the Project site to the I-15 frontage road.

BLM's Proposed Action, if approved, would assist BIA in addressing the management objectives in the Energy Policy Act of 2005 (Title II, Section 211) and Secretarial Order 3285A1 (March 11, 2009) that establishes the development of environmentally responsible renewable energy as a priority for the Department of the Interior. The BLM will decide whether to deny the proposed ROWs, grant the ROWs, or grant the ROWs with modifications.Modifications may include modifying the proposed use or changing the route or location of the proposed ROWs (43 CFR 2805.10(a)(1)). The water supply required for the Proposed Project would be leased from the Tribe and provided from the Tribe's existing production wells on the Reservation. The water supply would be delivered to the solar generating facility via an underground water pipeline located wholly on the Reservation. Because the BIA has a jurisdictional trust responsibility over Indian lands and the BLM has land management responsibilities under FLPMA, the Proposed Project is a major Federal action and compliance under the National Environmental Policy Act of 1969 is required. The Tribe, BLM, EPA, and NPS are cooperating agencies on the Proposed Project. The BIA and BLM will use the EIS to make BIA and BLM's respective decisions.

1.1.2 Need for the Proposed Action

The primary need for the Proposed Project is creating economic development opportunity for the Tribe as well as providing lease income as a long-term economically viable revenue source, creating new jobs and employment opportunities for Tribal members, and the development of sustainable renewable resources. The Proposed Project would also assist the Federal government, the state of Nevada and neighboring states meet their renewable energy goals by providing clean renewable electricity generation from the Tribe's solar resources that can be efficiently connected to the regional grid in a way that minimizes environmental impacts. Prior to the 1800s, the Moapa People were a culturally well-adapted people who combined farming with hunting and gathering. The Moapa People used the resources of the land with great ingenuity. Most domestic objects of the Moapa People's ancestors were various forms of intricately designed basketry, including water jars, winnowing and parching trays, cradle boards, cooking baskets and seed beaters. The Moapa People had great skill in the use of animal skins and plants. The Moapa People's knowledge of nutritional and medicinal uses of plants was extensive (Moapa Paiutes, n.d.). The Tribe identified the solar facility development as meeting the Tribe's economic development goals, as the solar facility development would provide much needed revenue to the Tribe, afford employment opportunity, and occupy only a small portion of the Reservation (<1 percent). The Proposed Project would provide long-term economic benefit and employment opportunities for the Tribe and the Tribe's members through a project that is consistent with the Tribe's tradition of respect for the land and fulfills the purposes for which the 70,000 acres were restored to the Tribe by the Federal Government in 1980 (Moapa Paiutes, n.d.). Also, the use of the Tribe's water by the Proposed Project would help the Tribe better establish the Tribe's rights to the Tribe's water. The Reservation was selected as the location of the Proposed Project due to the Reservation's solar resource, the availability of suitable land, transmission accessibility, and the Proposed Project's avoidance of designated conservation areas (i.e., Desert Wildlife Management Areas (DWMAs), Areas of Critical Environmental Concern (ACECs), designated Wilderness Areas, Wilderness Study Areas (WSAs), Land with Wilderness Characteristics (LWC) and other restrictive land use designations). The site of the Proposed Project would minimize environmental impacts, infrastructure needs, and costs by being located near existing infrastructure, and contribute to the local economy by creating employment opportunities, generating lease income for the Tribe, and encouraging expenditures in local businesses. The Proposed Project would also help meet the goals of the Federal Government to eliminate or reduce greenhouse gas (GHG) emissions and promote the deployment of renewable energy technologies. Renewable energy produced by the Proposed Project would help reduce the need for older fossil-fuel electric generating facilities including those currently affecting the Reservation which would contribute to the reduction of GHG emissions.

2 Project Description

This section provides a detailed description of the Proposed Action. The section describes the various components of the MSEC and includes discussions of the proposed construction process, operations and maintenance procedures, and decommissioning. The proposed MSEC would consist of a solar power generation facility (SPGF), gen-tie lines that would interconnect the Proposed Project to the regional electrical transmission grid, an access road between the SPGF and a frontage road along the west side of Interstate 15 (I-15), and a water pipeline. The SPGF and water pipeline would be located entirely on lands within the Moapa River Indian Reservation, the gen-tie lines would be located on both Reservation and BLM-administered lands, and the access road would be located primarily on BLM-administered lands.

2.1 Location and Setting

The Proposed Project would be located approximately 20 miles northeast of Las Vegas in Clark County, Nevada (Figure 1). The SPGF would be located on approximately 850 leased acres within the Reservation in Mount Diablo Meridian, Township 16 South, Range 64 East, Sections 29, 30, 31, and 32.The gen-tie lines and access road would be located on BLM-administered lands south and east of the Solar Power Generation Facility (SPGF) site within Township 17 South, Range 63 East and Township 17 South, Range 64 East. A water pipeline would be located on Reservation lands north and east of the Solar Power Generation Facility (SPGF) in Township 16 South, Range 64 East. Figure 2 shows the Proposed Action.

2.2 Project Components

The following sections describe the various components of the Proposed Action.

2.2.1 Solar Power Generation Facility (SPGF)

The Moapa Solar Energy Center (MSEC) Solar Power Generation Facility (SPGF) would be located wholly on lands within the Reservation. The Moapa Solar Energy Center (MSEC) Solar Power Generation Facility (SPGF) would be developed using photovoltaic (PV) technology to generate up to 200 Megawatts (MWs) of energy.

Project Description

Moapa Solar Energy Center (MSEC) Biological Assessment

2.2.1.1 PV Solar Technology Background

Solar photovoltaic (PV) technology converts sunlight directly into direct current (DC) electricity. The process starts with photovoltaic (PV) cells that make up photovoltaic modules. There are several types of photovoltaic (PV) solar cells. The two major types of cells are wafer-based silicon cells and thin-film cells. A number of 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 direct current (DC) from the array is collected at inverters where the direct current (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 the electricity to the facility substation, where the voltage is further increased by a high voltage transformer to be transmitted to the electric grid.

Solar Field

The proposed photovoltaic (PV) project would be up to 200 MW in size and would utilize crystalline silicon or thin-film photovoltaic (PV) panels that would be mounted on single-axis trackers. Using single-axis trackers, the panels will be oriented in north-south rows with the panels moving to track the sun as the sun moves across the sky during the day. The highest point on the single-axis trackers would be about 6 to 12 feet occurring during the morning and evening hours when the panels are tilted to face the rising or setting sun. This measurement is based on a 2 or 3-panel mounting system. The degree of tilt will change over the course of each day for the single-axis trackers. The photovoltaic (PV) units will be mounted on driven pile foundations to support the panel mounting system. The electrical equipment (inverters and transformers) will be in enclosures or covered by shade structures approximately 8 to 10 feet high. The proposed photovoltaic (PV) project will also include one or more small meteorological monitoring stations to track solar insolation, temperature, wind direction, and speed. These meteorological monitoring stations will have a height of approximately 10 feet.

Operations and Maintenance Area

An Operations and Maintenance (O&M) building would be developed on the Solar Power Generation Facility (SPGF) site. The Operations and Maintenance (O&M) building would contain administrative offices, parts storage, a maintenance shop, plant security systems, and plant monitoring equipment with adjacent worker parking. The Operations and Maintenance (O&M) building will likely consist of one or more single-story buildings with a maximum height of approximately 18 feet. The Operations and Maintenance (O&M) building will have exterior lighting on motion sensors and will have fire and security alarms.

Water Use/Water System

The photovoltaic (PV) Project would be expected to use up to 30 acre-feet per year (acf/y). Water will be provided to the photovoltaic (PV) Project by the Tribe from an existing well located on Reservation lands north of the Solar Power Generation Facility (SPGF) site. Water from the developed well will be piped to the Solar Power Generation Facility (SPGF) site via the pipeline described below. Two onsite raw water storage tanks will provide 12-hours of water supply to the facility. A portion of one tank will be dedicated to the fire protection water system.7|Page

486 Project Description MSEC Biological Assessment Water Supply/Pipeline Water for the Project would be provided to the Project by the Tribe from an existing well located in Section 15 about 5.4 miles northeast of the SPGF site. The water would be delivered to the SPGF site via a water pipeline. The pipeline would originate at the existing well and would follow existing roads and ROWs from the existing well to the SPGF site. Figure 2 shows the proposed location of the water pipeline. The water pipeline would be 8 to 12 inches in diameter and would be buried below the ground surface. Water Treatment The water used by the Project will require onsite treatment. The treatment requirements vary according to the quality required for each of the following uses. Raw water would be treated prior to feeding to the circulating water system to increase the cycles of concentration at the cooling tower, minimizing water consumption and reducing the size of the evaporation ponds (described further below). The raw water treatment system may consist of various components including multimedia filters, strong acid cation exchangers, interstage degasifier and strong base anion exchangers. The water treatment system components will be specified during the detailed engineering of the Project. To facilitate dust and contaminant removal from the solar field, demineralized water is used to clean the solar mirrors on a periodic basis, determined by the reflectivity monitoring program. This operation is generally done at night and involves a water truck spraying the solar mirrors in a drive-by fashion. Demineralized water for mirror washing is generated by the steam cycle makeup water treatment system. Wastewater Management The Project will generate wastewater streams including neutralized wastewater from the ion exchange pretreatment system. Process wastewater will be piped to lined, evaporation ponds that will be located within the fenced SPGF site. The evaporation ponds will be sized to retain all solids generated during the life of the Project. However, if required for maintenance, dewatered residues from the evaporation ponds will be sent to an appropriate offsite landfill as non-hazardous waste. Evaporation ponds covering approximately 5 acres are planned to allow plant operations to continue in event that an evaporation pond needs to be taken out of service. The evaporation ponds would be located entirely within the fenceline of the SPGF. The evaporation ponds will be designed to meet the Best Available Demonstrated Control Technology (BADCT) to minimize the amount of discharge and to provide best management and control of the discharge. To eliminate avian and bat use of the evaporation ponds, the evaporation ponds would be covered with bird proof netting. 2.2.1.2 Project Support Systems The following project support systems would be developed for the Project and would be located entirely within the SPGF. Site Substation A substation with medium voltage (12.5-kV or 34.5-kV) to high voltage (230-kV/500-kV) step-up transformer(s) with mineral oil, breakers, buswork, protective relaying, supervisory control and data acquisition (SCADA), and associated substation equipment would be located within the SPGF. The substation will be fenced for safety per codes and one or more structures may be outside the fence for 8|Page

487 "Project Description MSEC Biological Assessment meters and control equipment. The communication system for the substation may include above or below ground fiber optic cable or microwave tower. The project will be interconnected to the regional transmission system from this on-site substation/switchyard via the gen-tie interconnections described in subsection below. Fencing The SPGF perimeter will be secured with a minimum 8-foot tall, chain link metal-fabric security fencing with 1-foot barbed wire or razor wire on top. Controlled access gates will be located at the SPGF entrance. Permanent desert tortoise exclusionary fencing would also be installed around the perimeter of the SPGF. Fire Protection System The Project's fire protection water system will be supplied from a dedicated raw water storage tank, holding a minimum of 2-hours of full flow runtime, located on the SPGF site. One electric and one diesel-fueled backup firewater pump will be installed to deliver water to the fire protection water-piping network. Fire protection pump flowrates will be in accordance with applicable standards. A smaller electric motor-driven jockey pump will maintain pressure in the fire protection water-piping network. If the electric motor-driven jockey pump is unable to maintain a set operating pressure in the fire protection water-piping network, a main fire protection pump starts automatically. All fire protection system pumps must be shut off manually. The fire protection water-piping network will 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 will be located throughout the plant site. Security As mentioned above, the SPGF site will be fenced with a chain-link security fence.Site security will be provided via a small guard station provided at the gated access point to the site. Security cameras will be deployed throughout the site and monitored at the guard station and remotely by a security service at night. Lights, triggered by motion sensors and powered by station power with backup battery power, will also be installed at each entry gate and at each inverter. Perimeter signage will also be provided and installed at intervals along the perimeter fence stating, in both English and Spanish, the following: "Danger, Keep Out!", and "Hazardous Voltage Inside". The Project's lighting system will provide operation and maintenance personnel with illumination for both normal and emergency conditions near the main entrance and the Project substation. Lighting will be designed to provide the minimum illumination needed to achieve safety and security objectives and will be downward facing and shielded to focus illumination on the desired areas only. There will be no lighting in the solar field. Therefore, light trespass on surrounding properties will be minimal. If lighting at individual solar panels or other equipment is needed for night maintenance, portable lighting will be used.

The Project Site will be graded as needed to provide the required clearances for construction and operation of the solar field. Where grading is not necessary, vegetation will be trimmed as needed to allow the surface soils and local drainage to be left undisturbed. The stormwater collection system, including interception ditches, the collection ditch, retention ponds, and all ancillary facilities will be designed to meet applicable standards. The majority of the site will continue to be drained by sheet flow to on- and off-site drainages. Areas of the facility that have the potential for release of contaminates, such as the Operation and Maintenance (O&M) building, delivery areas, and paved roads will be provided with storm water containment that will be directed to an on-site retention basin. The retention basin will be designed to accommodate runoff from a 100-year storm event. Erosion on the site will be controlled through the implementation of best management practices that will be detailed in stormwater pollution prevention plans (SWPPPs) that will be developed for the construction and operational phases of the project.

Local area containments will be provided around certain locations, such as oil-filled transformers and chemical storage areas, in order to prevent water that may come in contact with oil or chemicals from leaving the site. The water from these oil-filled transformers and chemical storage areas and from other plant drains will be collected and sent to an onsite oil-water separator. The oil-free water would be added to the plant water and oil-water separator waste would be hauled offsite to an appropriate treatment facility. A spill prevention control and countermeasure plan (SPCC) will be prepared to meet the requirements of the regulations administered by the Environmental Protection Agency (EPA).

The construction of a new gen-tie transmission line is necessary to deliver the power generated by the MSEC to the electrical grid. One or two gen-tie transmission lines will be constructed based on the customer for the power generated at the Solar Photovoltaic Generation Facility (SPGF). The customer will determine whether the power generated by the SPGF will be delivered to the Harry Allen Substation (via a 230-kV transmission line) or the Crystal Substation (via a 500-kV transmission line) as different entities can be accessed from each location. The 230-kV or 500-kV transmission line will originate at the Project substation located on the SPGF site.

The gen-tie lines would consist of approximately 7.1 miles of single-circuit 230-kV overhead transmission line from the SPGF to the Harry Allen 230-kV Substation and approximately 1.6 miles of single-circuit 500-kV overhead transmission line from the SPGF to the 500-kV Crystal Valley Substation. The 230-kV line to Harry Allen would head south from the SPGF site for approximately 2.5 miles until meeting an existing 500-kV transmission line. The proposed transmission line would then follow, on the north side, the existing transmission line for approximately 4.1 miles and then stay north of the Harry Allen 500-kV Substation. The maintenance road associated with the existing 500 kV line would be used to the extent possible for construction and maintenance of the proposed 230 kV transmission line. Approximately 0.3 mile past the substation, the proposed line would cross the existing 500-kV transmission line at a 90-degree angle and proceed for another 0.4 mile before turning northeast for another 0.4 miles and connecting into the Harry Allen 230-kV Substation on the north side of the substation. This route is approximately 7.1 miles long.The design, construction, operation, and maintenance of the transmission lines will 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 landowners' property. Transmission line design will 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 and Reducing Avian Collisions with Power Lines by Edison Electric Institute and the Avian Power Line Interaction Committee (APLIC 2006, 2012). The Project is considering the steel monopole type of transmission structures for the 230-kV line to the Harry Allen Substation. The steel monopole type of transmission structures for the 230-kV line would range in height from 60 feet to 100 feet. The steel monopole type of transmission structures for the 500-kV line to the Crystal Substation would be steel monopoles also.

2.2.3 Access Road

The Project would require vehicular access for construction, operation, and maintenance. A 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15 would be constructed on BLM-administered lands. From the existing paved frontage road west of I-15, the proposed site access road would follow an existing dirt road for approximately 2.0 miles until the proposed site access road reaches the proposed 230-kV gen-tie transmission line ROW which the proposed site access road would follow approximately 0.5 mile north to the SPGF site (Figure 2). The access road would be designed to accommodate equipment deliveries, the construction workforce, and, ultimately, the operational needs of the Project. The roadway section would consist of two travel lanes, 24 feet wide with 5-foot shoulders and drainage swales on either side. The Applicant has requested a 100-foot-wide ROW so the existing road can be straightened if needed in some places. Final design for the access road would be consistent with BLM and Clark County road standards. The access road would be maintained by the Project.

2.3 Construction

2.3.1 SPGF Construction

2.3.1.1 Grading/Site Preparation

Prior to the initiation of Project construction, the SPGF site will be surveyed and staked. Preconstruction survey work would consist of locating the SPGF site and right-of-way boundaries, the locations of proposed facilities, and the centerlines of linear features, and access roads. Intensive field surveys would also be conducted prior to construction to determine the presence of cultural resources and special-status species within potentially affected areas. These intensive field surveys would be initiated following site survey and marking. Prior to the initiation of any preconstruction surveys, the necessary survey permits for rights-of-entry would be obtained from the BLM or the Tribe (if necessary). After all staking and surveying is complete, vegetation would be removed from the SPGF site where needed prior to grading. This removed vegetation will be handled in accordance with a plan that will be prepared in consultation with the Tribe and BIA. The removed vegetation will either be hauled off-site for disposal or possibly used to create wildlife habitats on off-site lands.

The SPGF site will be graded as needed to facilitate the construction and operation of the PV tracking system. Any needed grading would take advantage of the existing slope of the SPGF site, while eliminating any abrupt grade changes. Where grading is not needed, vegetation would be trimmed if needed to allow installation and operation of PV tracking system. This approach will allow those areas to retain the local undisturbed soil surface and local drainage. The final grading and drainage plan would be in compliance with all applicable stormwater standards and BMPs for erosion control.

2.3.1.2 Construction Sequencing

Construction of the SPGF, from site preparation and grading to commercial operation, will be expected to take 18 months. This schedule is conceptual and subject to change, including potential acceleration, depending on market conditions within the regional power markets. Construction will generally occur between 7 a.m. and 7 p.m., Monday through Friday. 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 to avoid pouring concrete during high ambient temperatures. The construction phases of the Project are expected to be as follows:

cent Clearing-Vegetation removal for installation of the SPGF facilities will 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.

cent Parking and Laydown-Parking areas for construction workers and laydown areas for construction materials will be prepared inside the solar field area. Detailed information regarding the location of the laydown and parking areas within the solar field will be developed after a contractor is hired to construct the facility.\*\*Access Road Construction\*\* - Construction access road beds will typically be 30 to 40 feet wide and surfaced with gravel, with 5-foot-wide crushed rock shoulders.

\*\*Site Grading\*\* - Because of the relatively flat topography at the site, relatively minimal volumes of soil would be moved as a result of grading.

\*\*Module Installation\*\* - The solar modules will be assembled and erected at an onsite erection facility.

\*\*Balance of Plant (BOP)\*\* - With the major equipment in place, the remaining field work will be electrical and involve smaller component installations.

\*\*Testing and Commissioning\*\* - Testing of subsystems will be done as the subsystems are completed. The solar modules will be tested once all supporting subsystems are installed and tested.

\*\*Site Stabilization\*\* - Disturbed areas will be stabilized during construction to minimize wind and water erosion and fugitive dust by watering and/or the use of dust palliatives. Permanent roads will be either paved or graveled. Cleared and graded surfaces that will not be subject to future disturbance will be revegetated. Revegetation will be conducted as soon as practicable, based on seasonal weather conditions, to maximize revegetation success.

\*\*Demobilization\*\* - All temporary fabrication and construction facilities will be removed from the site once construction is complete.

2.3.1.3 \*\*Site Access and Traffic\*\*

All equipment, permanent materials, and commodities for the Project will be transported to the site via rail and/or local highways. Any heavy equipment will be shipped via rail to the nearest active railroad spur for offloading and transported by truck to the Project site. All equipment and material deliveries will utilize the site access route. On-site roads will be surfaced with asphalt, aggregate base, or left surfaced with the native soil and treated with a dust palliative (only BLM approved palliatives would be used). The roads that are expected to see heavy use will be surfaced with asphalt; the primary roads within the solar fields will be surfaced with aggregate base; and the secondary roads within the solar fields will be graded native soils treated with dust palliative to minimize dust. There is currently little traffic on any of the roads bordering or in the immediate vicinity of the project. The use of these roads is associated with the nearby energy infrastructure in the area. Construction of the Project is expected to take up to 24 months. Daily trip generation during construction of the Project would be generated by the delivery of equipment and supplies and the commuting of the construction workforce. 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 300 each day, generating about 100 daily round trips. Deliveries of equipment and supplies to the site would also vary over the construction period but are expected to average about 10 to 20 daily trips. All project-related parking will be onsite during construction, moving within the solar field as the solar field is developed.

2.3.2 \*\*Gen-Tie Construction\*\*

Mobile construction equipment access would be required at each transmission structure. The Project would likely use a combination of new and existing access roads, and spur roads to place construction equipment at each structure. To access the ROW, construction vehicles would use the existing access road off the existing paved unnamed frontage road adjacent to I-15 going to the Harry Allen and Crystal Substations. This primary access road is maintained by NV Energy and minimal to no improvements would be necessary to facilitate gen-tie construction. Existing secondary access roads would be used to access the ROW where possible. Once within the ROW, spur roads may be used to access structure locations. The secondary access and spur roads are not routinely maintained and at some locations may require minimal improvements. Typical improvements would consist of minor grading and possibly limited addition of road base or rock in areas to allow safe vehicle travel. If spur roads are used, spur roads would be staked and flagged. To the extent possible, drainages would be crossed at grade. Standard road design techniques such as installing water bars and dips to control erosion may be used in sloped areas as necessary.

2.3.2.1 \*\*Structure Site Clearing\*\*

Adequately sized work areas would be required at each structure location to safely operate construction equipment and conduct construction activities (approximately 160 by 200 feet for 230 kV structures and 200 by 200 feet for 500 kV). In typical work areas in flat terrain, a work area would be required outside the permanent ROW for cranes to erect structures. Each conductor pulling and tensioning work area would require an additional work area. Specific details will be determined once further design is completed. The number of pulling and tensioning work areas will be determined during transmission line engineering and design. Dead-end structures may be required in areas where the transmission line turns at a large angle or crosses major obstacles such as large valleys, or in areas where the line ends.Two areas may be required at each dead-end structure to provide adequate space for vehicle turnaround. Each dead-end structure and each angle structure would be stabilized with either screw-anchor guy wires or plate-anchor guy wires. Plate anchors would be installed where soil stability is inadequate for screw-in anchors. Plate anchors would require trench excavation and potentially vegetation clearing. The number and location of dead-end structures will be determined during transmission line engineering and design. Vegetation at each structure location and each work area would be cleared only to the extent necessary as required to maintain safe working conditions at each structure location. Grading would not be conducted unless grading is needed to provide a safe work area for equipment. Following construction, surface disturbance at work areas and surface disturbance at structure locations on BLM-administered lands would be rehabilitated using seed mixtures and techniques developed in consultation with BLM. Surface disturbance on Tribal lands would be rehabilitated according to Tribal specifications. Permanent surface disturbance at structure locations would be minimized.

Transmission line construction would require several types of temporary work areas defined by function and location: cent Material storage, construction staging, and laydown cent Transmission structure installation cent Conductor pulling and tensioning After completing construction, temporary work areas on BLM-administered lands would be rehabilitated using seed mixtures and techniques developed in consultation with BLM. Noxious weed control would continue onsite during the rehabilitation process according to the specifications stipulated by BLM. Temporary work areas located on Tribal lands would be rehabilitated according to Tribal specifications.

Conventional construction methods would be used to haul, assemble, and erect the transmission structures. Trucks would be used to transport materials to each structure location. Structure materials would include: cent Steel and wooden poles cent Steel cross arms cent Insulators cent Hardware cent Stringing sheaves Steel structures would be assembled onsite and hoisted into place with a crane. In contrast, wooden poles would be placed in holes by the crane and then assembled. It is estimated that construction of the transmission line would occur over a period of approximately 4 to 6 months.

The proposed access road would include both upgrades to existing roads and development of new sections of road. Construction of the access road would be conducted using the proposed techniques identified below and discussed in the following subsections. Any significant modifications to the proposed construction techniques described in this section that arise during construction on BLM lands will be approved by the BLM prior to implementation to determine potential impacts and appropriate mitigation measures. The primary construction activities and areas of potential impact will be confined to the proposed road ROW. Coordination with existing ROW grant holders for the existing access roads will be conducted and affected agencies would be consulted before construction begins. The existing roads would be widened and sections of new road would be constructed using a bulldozer or grader. Front-end loaders would be used to move the soil locally. The road surface would be widened or developed to 24 feet and a 5-foot shoulder would be constructed on each side to facilitate drainage and to blend into the adjacent topography. Following grading, the surface 12 inches of the subgrade of the road would be scarified and moisture-conditioned and compacted by a roller to compact and smooth the ground surface. Approximately 14 inches of Class 2 road base would be placed above the compacted subgrade and the road base also would be moisture-conditioned and compacted. After project construction, this upgraded permanent access road would be used to provide access to the SPGF and also continue to be used by the existing road users who have ROWs from the BLM. The construction contractor selected to build this Project will be required to submit a specific Access Road Use Plan. The Access Road Use Plan would address continued use of the existing roads by the current ROW grant holders. The installation of culverts and other road improvement amenities would be reviewed and addressed 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 will be restored in a manner consistent with BLM and Tribal requirements to encourage natural revegetation.

Operation and maintenance activities associated with the PV Project are minimal. The Project is expected to require up to 20 personnel during operations. Daily operation of the plant begins when there is sufficient sunlight to begin operation of the solar trackers. The panels will be facing east in the morning and rotate on the single axis to follow the sun throughout the day. In the evening, the trackers will 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 typically work 8-hour days, Monday through Friday. Security and some maintenance staff will be on site on a 24-hour basis.Periods when non-routine maintenance or major repairs are in progress, the maintenance force may work longer hours and contract labor may be utilized as necessary. No heavy equipment will be used during normal plant operation. Operation and maintenance vehicles will include trucks (pickups, flatbeds, and 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.

The Project would operate at a minimum for the life of the Project's 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 Generating Facility (SPGF) would continue to be upgraded and used to generate solar energy even beyond the term of the initial energy purchase agreements. Therefore, it is possible that the SPGF site 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 SPGF site and the SPGF site would be revegetated with native species to a condition similar to the original condition of the Site. A restoration and revegetation plan 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 are to 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

The following sections summarize measures being proposed by the Applicant to avoid, minimize, and/or compensate for the potential impacts of the Proposed Action on federally listed species. These measures may be modified and/or supplemented based on discussions with the various permitting agencies (i.e., during the consultation process with USFWS or during the NEPA process with the BLM and BIA).

The Applicant will provide construction monitoring under the direction of biologists approved by the USFWS. The biologists will be given authority to supervise the functions listed below:

- Oversee establishment and functionality of sediment control devices as outlined in the Storm Water Pollution Prevention Plan (SWPPP). Ensure that Best Management Practices (BMPs) are in place and working properly on a weekly basis.

- Awareness training for desert tortoise will be provided to everyone onsite (performed by qualified personnel only).

- Biologists will monitor the construction activities daily during the initial site disturbance (including installation of temporary and permanent desert tortoise exclusion fencing) and at weekly intervals after all tortoises have been removed from the site. Biologists shall be onsite daily to respond to tortoise issues. Exclusionary fencing will be checked monthly and after any substantial rain event to ensure that the exclusionary fences are effective barriers for desert tortoise.

- Implement controls at entry locations to facilitate weed management and invasive species control in order to minimize infestation within the Action Area from an outside source. Trucks and other large equipment would be randomly checked before entering the site for any invasive species debris or seed.

The following conservation measures will be performed by the Applicant:

- A permanent perimeter of tortoise-exclusionary fencing will be constructed around the solar facility boundary. Pre-construction clearance surveys to remove tortoises from the construction area will be conducted following USFWS protocol (2010). Construction of the exclusionary fence will be monitored by a qualified biologist in order to eliminate impacts to tortoise burrows or live tortoises. The fence shall be maintained in accordance with Service standards. Tortoise guards shall be placed at all road access points, where the desert tortoise-proof fencing is interrupted, to exclude desert tortoises from the road and solar facility.

- Biological monitors to monitor the various construction crews in the active construction areas will be assigned until 100% tortoise clearance is confirmed. Biological monitoring would also occur during access road improvements and gen-tie and water pipeline construction in occupied desert tortoise habitat.

- The Applicant will pay a fee based on acreage of disturbance to the Tribe for disturbance of Tribal lands and to the BLM for disturbance of BLM 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 KRoad Moapa Solar Project and approved by the Tribe, BIA, and Service. A biological monitor will be present during maintenance activities if maintenance activities occur outside of the perimeter fence. Pre-maintenance clearance surveys followed by temporary exclusionary fencing may also be required in desert tortoise habitat, if the maintenance action requires ground or vegetation disturbance. Speed limits within the Action Area will be restricted to less than 25 miles per hour (mph) during construction and operation. Speed limit signs will be posted along the access road. Lower speed limits may be imposed to protect tortoises if determined necessary by the USFWS. Lighting will be focused inward toward the solar facility and downward to avoid lighting habitats beyond the Action Area perimeter. Any trenches or excavations would be covered if left overnight or have escape ramps to allow wildlife to safely exit. A Raven Control Plan (RCP) will be prepared for the project. The Raven Control Plan will prescribe the following measures to limit the impacts of common ravens and other avian scavengers on desert tortoise: Monitoring for the presence of ravens and other potential human-subsidized predators of special status wildlife will be conducted. Best management practices 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, and active monitoring of the site for presence of ravens. If ravens are seen building nests, this nesting material would be removed prior to an egg being laid. 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. A Weed Management Plan, which must be approved by the BIA, BLM, and the Tribe, will be implemented prior to the initiation of ground-disturbing activities. Mitigation measures in the Weed Management Plan include worker awareness training; limiting ground disturbance to designated areas only; maintenance of vehicle wash and inspection stations and close monitoring of materials brought onto the site to minimize the potential for weed introduction; re-establishment of native vegetation in disturbed areas to prevent weeds from colonizing newly disturbed areas; and regularly scheduled monitoring to quickly detect new infestations of weeds, coupled with rapid implementation of control measures to prevent further infiltration. A designated field contact representative (FCR) will be assigned to the construction phase of the solar project components; additional field contact representatives will be assigned for the linear project components, including the transmission line and water pipeline. Desert tortoises will be relocated to BLM-managed lands or Tribal lands following the Terms and Conditions in the Biological Opinion issued by the USFWS. Reporting of relocations and other information pertaining to desert tortoise will be completed per the Terms and Conditions in the Biological Opinion issued by the USFWS. Desert tortoise relocation would be considered a take and will require an incidental take authorization from the USFWS. If a tortoise is injured as a direct or indirect result of project activities, the tortoise shall be immediately transported to a veterinarian or wildlife rehabilitation facility. Tortoises within the solar facility footprint will be translocated to secure areas outside the fence as approved by the USFWS. The disposition of displaced desert tortoises will be evaluated and reported on following the Terms and Conditions of the Biological Opinion. Any project-related activity that may endanger a desert tortoise shall cease if a desert tortoise is found on the project site. Project activities may resume after an authorized desert tortoise biologist removes the desert tortoise from danger or after the desert tortoise has moved to a safe area. The Applicant and Tribe will coordinate to salvage and relocate cacti, yuccas, and shrubs on linear ROWs and plant the cacti, yuccas, and shrubs back on temporarily disturbed portions of the ROWs similar to the efforts undertaken on adjacent BLM lands. If the Tribe chooses to salvage plants from the solar facility, these plants may be held in a nursery or other temporary holding location until needed; no monitoring is required for these plants. 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. The Applicant will develop a habitat restoration plan to be implemented for all temporary disturbances associated with construction of the project to be approved by the BIA, BLM (for disturbance of BLM land), Tribe, and the USFWS. The Tribe will implement the Reservation-wide desert tortoise conservation plan that was required under Term and Condition 5.h. in the K Road Moapa Solar Project.

The Environmental Baseline MSEC Biological Assessment 3 Environmental Baseline 3.1 Biological Setting states that the Action Area is located within the Mojave Desert approximately 20 miles north 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 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. The Mojave Desert is characterized by the creosotebush - white bursage plant community and Joshua trees (Yucca brevifolia) at the higher elevations; considered an indicator species for this desert (Gucker 2006). The desert is believed to support between 1,750 and 2,000 species of plants. 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 20F (-7C) on valley floors, and below 0F (-18C) 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 80F (27C).

Vegetation Communities Present within the Action Area are composed primarily of Mojave Desert creosote bush scrub as defined by Holland (1986) classification of plant communities. Disturbed areas, both within and adjacent to the Action Area, are associated with multiple dirt roads and less impacted off-road vehicle trails, adjacent to the railroad and interstate highway (to the east) and adjacent to transmission line and natural gas line corridors (to the north and west). Table 1 lists the acreages of the various vegetative cover types occurring within the project area.

The Environmental Baseline MSEC Biological Assessment Table 1 - Vegetative cover types within the Project area - SPGF site and Linear ROWs provide the following data:

- Project Component Vegetative Covertype Acreage Creosotebush-White Bursage 817.6

- Disturbed 2.5 SPGF Xeroriparian 29.8 TOTAL 849.9 Cactus/Yucca 45.1

- Creosotebush-White Bursage 37.8 Disturbed 3.9 Mesquite 2.8

- 230kV ROW Playa Lake 22.1 Saltbush 10.4 Xeroriparian 5.5 TOTAL 127.5

- Creosotebush-White Bursage 25.8 Disturbed 1.6

- 500kV ROW Xeroriparian 0.3 TOTAL 27.7 Creosotebush-White Bursage 23.9

- Disturbed 3.5 Proposed Access ROW Xeroriparian 2.7 TOTAL 30.1

- Creosotebush-White Bursage 26.4 Disturbed 4.8 Alt Access ROW Xeroriparian 0.8 TOTAL 32.0

- Creosotebush-White Bursage 21.4 Disturbed 10.4

- Pipeline ROW Xeroriparian 0.7 TOTAL 32.5 PROJECT AREA TOTAL 1099.6

The Creosotebush Series Creosotebush-White Bursage community is dominated by creosotebush shrubs (Larrea tridentata) and white bursage (Ambrosia dumosa), 0.5-3m tall, widely spaced, usually with bare ground between. Many species of ephemeral herbs may flower in late March and April if the winter rains are sufficient. This plant community is usually found on well-drained secondary soils with very low water-holding capacity on slopes, fans, and valleys.Environmental Baseline MSEC Biological Assessment: Other, less numerous species of annuals appear following summer thundershowers. This creosotebush scrub is typical of the Mojave Desert. Nearly the entire SPGF and most of the gen-tie transmission routes, access road, and water pipeline are covered by the creosotebush scrub vegetation community. Cactus/Yucca Cactus/yucca is also present and concentrated near the south end of the 230-kV gen-tie option. Cactus species observed during the biological surveys were the barrel cactus (Ferocactus acanthodes), beavertail cactus (Opuntia basilaris), cottontop cactus (Echinocactus polycephalus), hedgehog cactus (Echinocereus engelmannii var. chrysocentrus), pencil cholla (Opuntia ramosissima), silver cholla (Opuntia echinocarpa), grizzlybear prickly pear (Opuntia polyacantha var. erinacea), and teddybear cholla (Opuntia bigelovii). Most cacti were concentrated in ephemeral washes as well as on a sloping bajada near the Harry Allen Substation. Xeroriparian habitats were associated with the several small washes that cross the various portions of the project area. The xeroriparian habitats generally resembled the Creosotebush-white bursage habitats but had a higher overall density of vegetation as well as a greater abundance of big galleta grass. Other species included cholla, cheesebush (Hymenoclea salsola) and ephedra (Ephedra sp.).

Approximately 10.4 acres of saltbush occurs within the ROW of the 230-kV gen-tie option and is found at the margins of the playa lake. The areas including small but monotypic stands of saltbush (Atriplex sp.) form the transition between the surrounding upland habitats and the playa lake. The 230-kV gen-tie transmission option crosses a large playa lake. The playa lake habitat type consists of unvegetated habitats with highly compacted soils. The playa lake is likely subject to ephemeral flooding following large precipitation events.

Several small mesquite bosques are located within the perimeter of the playa lake. These mesquite bosques represent monotypic stands of mesquite (Prosopis sp.) with no understory species. Disturbed habitats include all areas with little or no native vegetation as a result of anthropogenic disturbance. The disturbed habitats include existing roads, transmission line pole sites, pipeline right-of-ways and other areas that have been significantly altered.

Soils typical of soils in arid environments, local soils are poorly developed and shallow, almost completely absent in some areas. In general, the local soils are typically only four inches deep and rarely more than 18 inches in depth over an underlying caliche layer. The 1,000-acre SPGF site contains two soil series - the Grapevine series which covers approximately 95 percent and the Ireteba series that makes up the remaining 5 percent. Soils where the proposed gen-tie transmission line corridors, access road, and water pipeline are located include the Anthony, Bard, Mormon Mesa, St.

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey maps (USDA NRCS 2006) were used to determine the soil information for the Action Area. The Anthony series consists of very deep, well-drained soils formed in stratified alluvium. The Anthony soils are on alluvial fans and floodplains and have slopes of 0 to 15 percent. Vegetation on Anthony soils includes creosotebush, white bursage, cacti, palo verde, bush muhly, spike dropseed, Pima pappusgrass, fourwing saltbush and annual forbs and grasses. The Bard series consists of shallow soils over cemented material, well-drained soils that formed in alluvium derived predominantly from limestone and dolomite with some sandstone and quartzite. The Bard soils are on dissected valley fill terraces, alluvial fans and fan remnants. Slope ranges from 0 to 15 percent.The vegetation is mainly creosotebush, white bursage, annual buckwheat, cholla, and other cacti. 3.2.1.3 Glendale Series (Gs) The Glendale series consists of very deep well-drained soils formed in stratified alluvium. Glendale soils are on alluvial fans, flood plains, and stream terraces and have slopes of 0 to 5 percent. Glendale soils are used for livestock grazing and irrigated cropland. The present vegetation in Glendale soils is creosotebush, mesquite, palo verde, ironwood, salt cedar, cacti, annual forbs, and grasses. 3.2.1.4 Grapevine Series (Gv) The Grapevine series consists of deep, well-drained, fine sand soils that formed in mixed alluvium with some gypsum. Grapevine soils occur on fan piedmonts and alluvial flats. Elevations are 1,700 to 3,600 feet and slopes range from 0 to 15 percent. The soil surface is covered by approximately 10 percent gravel. The present vegetation in Grapevine soils is mainly creosotebush, white bursage, and Indian ricegrass. 3.2.1.5 Ireteba Series (Ir, It) Ireteba soils occur on the smooth, nearly level lower margins of alluvial fans and in flat basins. The slope gradients for Ireteba soils are commonly less than 0.2 percent, but may include slopes up to 1 percent. Ireteba soils have developed in loamy alluvium derived from mixed rock sources including assorted volcanic and sedimentary rocks. Vegetation in Ireteba soils consists mainly of creosotebush, white bursage, and desert sage. The plant density on Ireteba soils is about 2 percent. 3.2.1.6 Mormon Mesa Series (MOB) The Mormon Mesa series consists of shallow over petrocalcic, well-drained soils that formed in material influenced by calcareous loess over mixed alluvium from predominantly limestone sources. The Mormon Mesa soils are on summits of fan remnants and mesas. Slope ranges from 0 to 15 percent. The vegetation in Mormon Mesa soils is scattered white bursage, yucca, and creosotebush with some big galleta and Indian ricegrass. 3.2.1.7 St. Thomas Series (RTF) The St. Thomas series consists of very shallow and shallow, well-drained soils that formed in residuum and colluvium derived from limestone and dolomite. The St. Thomas soils are on hills and mountains. Slope ranges from 2 to 75 percent. The present vegetation in St. Thomas soils is mainly creosotebush, white bursage, big galleta, and Indian ricegrass. 3.2.1.8 Tonopah Series (CTC, THB, TMB) The Tonopah series consists of very deep, excessively to well-drained soils that formed in mixed alluvium. Tonopah soils are on fan remnants and fan piedmonts. Slope ranges from 0 to 15 percent. The present vegetation in Tonopah soils is mainly creosotebush and white bursage. 3.3 Water Resources The Proposed Action lies in a northeastern portion of the Mojave Desert in the internally drained Garnet Valley (Dry Lake Valley) groundwater basin within the watershed of the Colorado River. To the west and north, the area is bound by Paleozoic limestone outcrops that are the limits of the Arrow Canyon Range. The area is flanked to the east by the North Muddy Mountains that are the extent of the California Wash drainage basin. The Moapa Valley lies to the northeast. To the southeast, the main course of California Wash flows northeast to the Muddy River. The elevation within the site ranges from about 1,960 feet to 2,080 feet above sea level. 3.3.1 Surface Water A field investigation conducted in May 2010 identified seven ephemeral drainages and one playa in the Action Area. No surface water was identified within the drainage features or within the playa feature. Ephemeral drainages provide natural distribution of water and sediments, recharge of groundwater in the area, and a sporadic but local water supply for wildlife. A playa is defined as the flat-floored bottom of an undrained desert basin that becomes at times a shallow lake. Playas collect water from drainages or precipitation and collected surface water typically evaporates leaving deposits of salt or gypsum on the soil surface (CH2M Hill 2010). The ephemeral drainages all drain into the California Wash located approximately 3 miles east of the Action Area on the east side of I-15. The Action Area does not contain or drain to a wild and scenic river (Wild & Scenic River Council 2009).The SPGF site is not within the FEMA 100-year floodplain; however, the gen-tie transmission lines connecting to the Harry Allen Substation would cross a 100-year floodplain. 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 Proposed Action 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 in terms of detailed documentation. Seven groundwater management basins are superimposed on the Arrow Canyon Range field. 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 (K Road FEIS 2012). As mentioned earlier, the Proposed Action is located within the California Wash hydrographic basin, which is an unconsolidated sand and gravel aquifer. The California Wash hydrographic 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; Bohannon 1983). 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 Proposed Action is around 5,000 feet thick (K Road FEIS 2012). Regional patterns of precipitation combined with terrain elevation result 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 Proposed Action indicate the static water level ranges in depth from 354 to 526 feet below the surface and the wells yield over 1,000 gallons per minute (gpm; K Road FEIS 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 of 0.03 to 0.008 (K Road FEIS 2012).

The Proposed Action is located in the Dry Lake Valley basin in the northeastern portion of the Mojave Desert. The Dry Lake Valley basin lies within the Basin and Range Region of the southwestern U.S. with topography that is characterized by linear, north and south trending valleys and normal fault-block mountain ranges resulting from the extension of the Earth's crust. The climate in the Dry Lake Valley basin is typically semi-arid and deserts form in the rain shadows of linear mountain ranges. Precipitation, which drains to interior closed basins, results in the formation of evaporite playa lakes, such as Dry Lake Playa in the southern portion of the Proposed Action (Benson and Darrow 1981; Longwell et al. 1965). The mountains which border the Dry Lake Valley include the Arrow Canyon Range to the west, and the Dry Lake Range to the east. The Arrow Canyon Range is composed primarily of carbonate rocks of the Bird Spring Formation that are Ordovician to Permian in age (Longwell et al. 1965; Stewart and Carlson 1977). Elevations across the Proposed Action range from approximately 1,960 feet to 2,080 feet.

Only one federally listed species under the ESA was documented within or near the MSEC: the desert tortoise (Gopherus agassizii). Section 4.2 lists details of the implemented survey protocol and the results. Moapa dace are endemic to the Muddy River, located approximately 12 miles north of the Proposed Action. The Muddy River and associated springs would be in the area of effects for groundwater pumping associated with the Proposed Action. 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 Proposed Action, though critical habitat units for the desert tortoise occur approximately 2.5-4 miles west of the Proposed Action on the west side of the Arrow Canyon Range.

A total of 13 species listed under the ESA were considered for analysis: three candidates for listing, two species listed as threatened, and eight species listed as endangered.All species except for the desert tortoise and Moapa dace were considered to be absent from the site, no suitable habitat was present on site, or the species' habitat is far removed from the Proposed Action and would not potentially be affected by groundwater pumping. This section contains an account of each species that was excluded from further analysis. 4.1.1 Pahrump Poolfish The Pahrump poolfish (Empetrichthys latos) was listed Endangered in its entire range on March 11, 1967 (32 FR 4001). Originally called the Pahrump killifish, the Pahrump poolfish is a member of the Goodeidae family. The Pahrump poolfish reaches about 5.1 cm at maturity and is omnivorous, feeding on a wide variety of available plant and animal material. The Pahrump poolfish has been extirpated from the Pahrump poolfish's native range (a single headwater spring) and is only known from two transplant springs, one of which (Corn Creek Springs) is within Clark County, approximately 25 miles west of the Action Area. Corn Creek Springs is not within the area of effects for the proposed groundwater water withdrawals. Therefore, the Pahrump poolfish is excluded from further analysis. 4.1.2 Lahontan Cutthroat Trout The Lahontan cutthroat trout (Oncorhynchus clarki henshawi) was listed Endangered on October 13, 1970 (35 FR 16047 16048), reclassified as Threatened on July 16, 1975 (40 FR 29863 29864). A Recovery Plan for the Lahontan cutthroat trout was approved on January 30, 1995. The Lahontan cutthroat trout is an inland subspecies of cutthroat trout belonging to the Salmonidae family. Stream-dwelling Lahontan cutthroat trout generally live less than 5 years, and lake-dwelling Lahontan cutthroat trout live between 5 and 9 years. Lahontan cutthroat trout range between 10 and 15 inches in length and feed on terrestrial and aquatic insects. The Lahontan cutthroat trout is native to the Lahontan Basin in northwestern Nevada; there is an introduced population of Lahontan cutthroat trout in Carpenter Canyon approximately 49 miles southwest of the Action Area. This watershed is not within the area of effects for the proposed groundwater water withdrawals. Therefore, the Lahontan cutthroat trout is excluded from further analysis. 4.1.3 Woundfin The Woundfin (Plagopterus argentissimus) was listed Endangered on October 13, 1970 (35 FR 16047 16048), Critical Habitat listed on January 26, 2000 (65 FR 4140 4156). The Woundfin's Recovery Plan was approved on April 19, 1995. The Woundfin is a member of the Cyprinidae family. The Woundfin is considered the most highly specialized species in the genus Plagopterini (Miller and Hubbs 1960). The Woundfin rarely achieves a standard length of more than 3 inches. Woundfin are opportunistic omnivores and will feed on filamentous algae, detrital material, tamarisk seeds, and insects depending on availability. The Woundfin's current distribution is limited to the mainstem of the Virgin River from Pah Tempe Springs downstream to Lake Mead. The Woundfin is believed to be extirpated from the Moapa (Muddy) River. The Virgin River is not within the area of effects for the proposed groundwater water withdrawals. Therefore, the Woundfin is excluded from further analysis. 4.1.4 Virgin River Chub The Virgin River Chub (Gila seminude) was listed Endangered on August 24, 1989 (54 FR 35305-35311). The Virgin River Chub's Recovery Plan was approved on April 19, 1995. The Virgin River Chub is a subspecies of Gila robusta of the Cyprinidae family and is considered the rarest native fish in the Virgin River. The Virgin River Chub is silvery, medium-sized, and is typically 20 cm, but can grow up to 45 cm. Riverine habitat for the Virgin River Chub typically includes areas of slow to moderate flow with deep runs or pools where large boulders or root snags provide instream cover. The Virgin River Chub historically occurred in the Virgin River from La Verken Springs, Utah, downstream to the confluence of the Virgin River with the Colorado River in Nevada (USFWS 1995). Presently, the Virgin River Chub is known to occur in the Virgin River from La Verken Springs, Utah, downstream to the Mesquite Diversion in Nevada.The Virgin River chub is also known to occur in the Muddy River, but the separate population of the Virgin River chub in the Muddy River is not listed as endangered. The Virgin River (and, thus, the only listed portion of the Virgin River chub population) is not within the area of effects for the proposed groundwater water withdrawals. Therefore, the Virgin River chub is excluded from further analysis.

4.1.5 Bonytail Chub

Bonytail chub (Gila elegans) was listed Endangered (45 FR 27710 27713, 1980 April 23) with Critical Habitat (59 FR 13374 13400, 1994 March 21). The Recovery Plan was completed September 4, 1990. The body of an adult bonytail chub is highly streamlined; a greenish-grey, dusky color on the bonytail chub's back with silvery sides, and a white belly. The bonytail chub may reach up to 24 inches in length and weigh over 2 pounds. The closest known population of bonytail chub is in Lake Mohave, approximately 66 miles south of the Action Area. Lake Mohave is not within the area of effects for the proposed groundwater withdrawals. Therefore, the bonytail chub is excluded from further analysis.

4.1.6 Razorback Sucker

Razorback sucker (Xyrauchen texanus) was listed Endangered (56 FR 54957 54967, 1991 October 23) with Critical Habitat (59 FR 13374 13400, 1994 March 21). The Recovery Plan was completed December 23, 1998. The razorback sucker, also known as the humpback sucker, is a member of the Catostomidae family. The species can grow more than 2 feet in length, weigh more than 6 pounds, and live 40+ years. Examination of stomach contents of adult razorback suckers from Lake Mohave indicates that the razorback sucker is a benthic feeder, whose diet includes planktonic crustaceans, diatoms, filamentous algae, and detritus (USFWS 1991). The razorback sucker is known to occur in Lake Mead, approximately 23 miles east of the Action Area. Water withdrawals may affect flows within the Muddy River, which flows into Lake Mead. However, the reduction of flows within the Muddy River compared to the amount of water within Lake Mead would be negligible; therefore, the razorback sucker is excluded from further analysis.

4.1.7 Yuma Clapper Rail

The Yuma clapper 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 Action Plan were initiated over the ensuing years. The Yuma clapper 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). Adult females are slightly smaller. Adult Yuma Clapper Rails of both sexes are similar in plumage; the rails possess a long, slender bill and long legs and toes compared to body size (Todd 1986). The present range of the Yuma clapper rail in the U.S. includes portions of Arizona, California, and Nevada. The Yuma clapper 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 Baccharis sp.) along the shoreline of the marsh (Eddleman 1989). No habitat for the Yuma clapper rail occurs within the Action Area. The Yuma clapper rail is known to occur along the Muddy River within the Overton Wildlife Management Area. 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 clapper rail habitat (e.g., hydrophytic vegetation). Therefore, the Yuma clapper rail was eliminated from further analysis.

4.1.8 Yellow-billed Cuckoo

The Yellow-billed cuckoo (Coccyzus americanus) is a federal candidate for listing under the ESA. The yellow-billed cuckoo has always been rare in Nevada and while there are still small areas of suitable habitat within the state, breeding populations of the yellow-billed cuckoo are apparently extirpated from Nevada (Center for Biological Diversity 1998). Because of recent habitat loss and further decline in numbers, the USFWS has raised the listing priority for the Western Continental U.S.Distinct Population Segment of this species (FR 70: 24875). Yellow-billed Cuckoos may still utilize remnant habitats present within the state during migration. Based on historic accounts, Yellow-billed Cuckoos were widespread and locally common in California and Arizona, locally common in a few river reaches in New Mexico, locally common in Oregon and Washington, generally local and 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. 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 Cuckoos or cuckoo habitat (e.g., hydrophytic and riparian vegetation). Therefore, the Yellow-billed Cuckoo was eliminated from further analysis. 4.1.9 Southwestern Willow Flycatcher The southwestern willow flycatcher (Empidonax traillii extimus) was listed by the USFWS as an endangered species within the southwestern willow flycatcher's entire range on February 27, 1995 (FR 60: 10693-10715). Critical habitat for the southwestern willow flycatcher was originally established in 1997 (FR 62: 39129-39147) but subsequently vacated and incidental protection provided along the Virgin River and the Virgin River's 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) and redefined and re-instituted in 2005 (FR 70: 60886-61009). Critical habitat for the southwestern willow flycatcher in Nevada is currently limited to portions of the Virgin River above the Virgin River's confluence with the Muddy River (FR 70: 60886-61009). 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 riparian or microhabitat conditions exist within the Action Area. The closest known breeding habitat for this species is located along the Muddy River, approximately 12 to 24 miles north and northeast of the Action Area. While groundwater withdrawals may result in insignificant reductions in flow in the Muddy River, the magnitude of effects to southwestern willow flycatchers or southwestern willow flycatcher habitat (including hydrophytic vegetation) would be insignificant and discountable. Therefore, the southwestern willow flycatcher was eliminated from further analysis. 4.1.10 Relict Leopard Frog The relict leopard frog is a candidate for listing under the ESA. In May 2002, the USFWS was petitioned to list the relict leopard frog as an endangered species under the ESA (Center for Biological Diversity and Southern Utah Wilderness Alliance 2002). The petition was largely based on the restricted distribution of the known populations and low numbers of individuals of the species. The relict leopard frog (Lithobates onca) is a medium-sized frog (1.75-3.5 inches in length) in the family Ranidae (true frogs). Generally, the relict leopard frog is brown to grey above with greenish brown spots that are often reduced or obscure on the front of the body. Relict leopard frogs generally require shallow water with emergent vegetation for foraging and basking, and deeper water, root masses, undercut banks, and debris piles for cover and hibernacula. Relict leopard frogs are currently known to occur only in seven natural and eight translocated sites within two general areas in Nevada: near the Overton Arm area of Lake Mead (approximately 24 miles southeast of the Action Area), and Black Canyon below Lake Mead (approximately 29 miles south of the Action Area; Bradford et al. 2004). Water withdrawals may result in insignificant reductions in flow in the Muddy River, which flows into the Overton Arm of Lake Mead. However, the reduction of flows within the Muddy River compared to the amount of water within Lake Mead would be negligible; therefore, the relict leopard frog is excluded from further analysis. 4.1.11 Las Vegas Buckwheat The Las Vegas buckwheat (Eriogonum corymbosum var. nilesii) is a woody perennial shrub that grows up to four feet high and has a mounding shape.The subspecies of the plant is distinguished from closely related plants by leaves that are densely hairy on one or both surfaces and at least twice as long as the leaves are wide, with dense hairs spread along the stem. The numerous flowers of the plant are small and yellow with small bract-like leaves at the bases of the flowers. The Las Vegas buckwheat has a distinct preference for soils with high gypsum content. Typically, gypsum soil outcroppings occupied by Las Vegas buckwheat are sparsely vegetated with exposed soils covered with a cryptogamic (living) soil crust. This plant is confined to extremely limited areas in the counties of Clark and Lincoln, Nevada. Soils within the Action Area are generally not suitable for Las Vegas buckwheat. Rare plant surveys did not detect Las Vegas buckwheat (Nevada Biological Consulting 2010) and there are no records of Las Vegas buckwheat occurring within the Action Area. Therefore, Las Vegas buckwheat was excluded from further analysis.

The desert tortoise consists of two geographically dissimilar populations: the Sonoran desert tortoise and Mojave desert tortoise. The Sonoran population of the desert tortoise is found in most of Arizona, western New Mexico and south through Sonora to northern Sinaloa, Mexico. The Sonoran population of the desert tortoise also occurs on Isla Tiburon, in the Sea of Cortez (Germano et al. 1994). The Mojave population of the desert tortoise is found in southern Nevada, southeastern California, the Beaver Dam Mountains and Virgin River area of southwestern Utah and northwestern Arizona. The Mojave population of the desert tortoise is restricted to areas north and west of the Colorado River. The Mojave population of the desert tortoise has been divided into six distinct population segments or Evolutionarily Significant Units (ESU), each designated as a recovery unit. Each recovery unit was delineated based on variations in genetic, morphological, ecological, physiological, and behavioral traits (USFWS 1994). Some of the six recovery units were further subdivided into DWMAs. A total of 6.4 million acres of Critical Habitat was designated in 1994 (59 FR 5820-5866). Within those six recovery units, DWMAs were identified, where populations of tortoises facing similar threats would be managed with the same strategies (59 FR 5820-5866). Among the most important recovery actions implemented pursuant to the 1994 Recovery Plan has been formalizing DWMAs through Federal land use planning processes. On Bureau of Land Management lands, DWMAs are administered and designated as Areas of Critical Environmental Concern (ACEC). These ACECs define specific management areas based on the general recommendations for DWMAs in the 1994 Recovery Plan. Boundaries of the ACECs were refined slightly from the critical habitat designation based on various management and biological considerations. The Bureau of Land Management DWMAs/ACECs, together with National Park Service lands, designated wilderness areas, other lands allocated for resource conservation, as well as restricted-access military lands, provide an extensive network of habitats that are managed either directly or indirectly (e.g., wilderness areas outside desert tortoise ACECs) for desert tortoise conservation (USFWS 2011c). The Proposed Action is located within the Northeast Mojave - North Recovery Unit. The Proposed Action is not within a DWMA; the Proposed Action is largely contained within the boundary of the Moapa Band of Paiutes Reservation within the Dry Lake Valley west of Interstate Highway 15. The nearest DWMA (Mormon Mesa) to the Action Area is located approximately 2.4 miles to the west, on the west slope of the Arrow Canyon Range.

The desert tortoise was first described by Cooper in 1863 as Xerobates agassizii, named after Louis Agassiz. Over the years, the desert tortoise has been known under different genera including Scaptochelys (Bramble), Xerobates (Lamb et al.), and Gopherus (Crumley 1994), the genus under which the desert tortoise is now recognized. The desert tortoise has a domed carapace and a relatively flat, unhinged plastron. Adult desert tortoises will reach a carapace length of 8 to 15 inches and shell height of 4 to 6 inches. Adult desert tortoises typically weigh 8 to 15 pounds. When desert tortoise hatchlings emerge from their eggs, the hatchlings are approximately 2 inches long (Ernst et al. 1994). The desert tortoise is greenish-gray to dark brown with tan scute centers. The desert tortoise's forelimbs have heavy, conical scales and are flattened for digging and burrowing. The hind limbs of the desert tortoise are more elephantine.When limbs pull in, limbs block the openings of the shell (Ernst et al. 1994). 4.2.2 Distribution and Life History The Mojave population of the desert tortoise is found primarily in Mojave desert scrub and is also found, to a lesser extent, in the Lower Colorado River Subdivision of Sonoran desert scrub in southeastern California. The Mojave population of the desert tortoise is generally associated with communities dominated by creosote bush, often with other shrubs such as white bursage or saltbush (Atriplex spp.) occurring as co-dominants with small cacti present (AGFD 2001). Some parts of the Mojave population of the desert tortoise's habitat may contain abundant Joshua trees (Yucca brevifolia). In contrast to the Sonoran population, the Mojave population desert tortoises prefer sandy loam or rocky soils in valleys, bajadas, and hills. The Mojave population desert tortoises may be found at elevations below sea level in Death Valley, California, and up to about 5,000 feet at Yucca Mountain, Nevada (AGFD 2001). Adequate shelter is a critical habitat component for the Mojave desert tortoise. Like the Sonoran population, the Mojave population use burrows to avoid extreme hot or cold temperatures. The Mojave desert tortoises are more likely to excavate burrows under vegetation than in rocky areas, and the Mojave desert tortoises' burrows can be up to 10 meters (33 feet) in length (AGFD 2001). The utilization of burrows by the Mojave desert tortoise aids in body temperature regulation through higher humidity and the resultant evaporative cooling effects within the burrow (Lawler, no date). The annual cycle of the Mojave desert tortoise begins in February or March when the Mojave desert tortoises emerge from hibernation (AGFD 2001). Mating generally takes place in the spring, and 2 to 14 eggs are laid in an excavated nest near a shrub or burrow entrance between May and July (Lawler, no date). Young tortoises emerge from the eggs after incubating for 70 to 135 days (Lawler, no date). Hatchling and juvenile mortalities are very high; it has been estimated that only one hatchling for every 15 to 20 nests will survive to reach sexual maturity (Lawler, no date). Average age of sexual maturity of females is primarily a function of animal size, but is usually between the ages of 12 and 25 years. Members of the Mojave population produce from one to three clutches of eggs per year, but the total number of eggs laid may be similar to the single larger clutch produced by Sonoran population tortoises. Desert tortoises are primarily herbivores, consuming a wide variety of plant materials including dicot annuals, grasses, herbaceous perennials, trees, shrubs, subshrubs/woody vines, and succulents (AGFD 2001). A study of the diet of desert tortoises in the Mojave Desert found that the desert tortoises used 43 plant species, including 37 annuals and 6 perennials (Jennings 1997). Some of the preferred plants were dwarf white milkvetch (Astragulus didymocarpus), widow's milkvetch (A. Zayneue), Booth evening primrose (Camissonia boothii), rattlesnake weed (Camissonia [Euphorbia] albomarginata), foothill deervetch (Lotus humistratus), Bigelow four o'clock (Mirabilis bigelovii), and brightwhite (Prenanthella exigua). Desert tortoise 31 | P a g e

510 "Description of Species MSEC Biological Assessment diet in this study showed a very strong preference for native plants (95.3 percent), and some of the preferred food plants of the desert tortoises were uncommon to rare (Jennings 1997). A study on juvenile tortoises (Spangenberg 1995) found a preference for non-native invasive plant species such as Mediterranean grass (Schismus barbatus) and filaree (Erodium cicutarium). These two species comprised 64 percent of the juvenile tortoise diet. This study also revealed a difference in diet between wet and dry summers. During a very dry summer, tortoises were observed foraging on only three species, while the tortoises used 15 species during a wet summer (Spangenberg 1995). Desert tortoises may forage selectively, sampling several possibilities before consumption (Lawler, no date). Selective food preferences for individual tortoises within a population make plant species diversity an important constituent of preferred tortoise habitat (Tracy 2001). Desert tortoises will also ingest rocks, bones, and soil, possibly to maintain intestinal bacteria, to provide additional minerals, or as gastroliths to aid digestion (Lawler, no date).The Mojave population of desert tortoise occurs primarily on flats and bajadas with soils ranging from sand to sandy-gravel, characterized by scattered shrubs and abundant space for growth of herbaceous plants. The Mojave population of desert tortoise occurs in creosote bush, alkali sink, and tree yucca habitats in valleys, on alluvial fans, and in low rolling hills at elevations ranging from sea level to 5,000 feet. The Mojave population of desert tortoise appears to prefer bajadas and desert washes where soils range from sandy-loam to light gravel-clay which is optimal for burrow construction. Shelter sites for the Mojave population of desert tortoise often occur on lower bajadas and basins in burrows dug in soil, cavities in sides of washes and depressions under shrubs. 4.2.3 Threats to the Species In general, downward trends in desert tortoise numbers and habitats result from urban development, long-term livestock grazing, mining, off-highway vehicle use, and collecting. Mortimer and Schneider (1983) suggested a Nevada die-off in the early 1980s was due in part to drought conditions and that habitat had been adversely impacted by long-term grazing intensities. D'Antonio and Vitouseki (1992) found that the increasing incidence and severity of fires combined with changes in vegetative community types, primarily increases in exotic ephemerals, have adversely affected desert tortoises. Habitat fragmentation is another major contributor to population declines (Berry 1986). Desert tortoise populations have been fragmented and isolated by urban development, highway construction, and development within powerline corridors. The most serious problems facing the Mojave population of the desert tortoise are the "cumulative effects of human and disease-related mortality accompanied by habitat destruction, degradation, and fragmentation" (USFWS 1994). Human contact includes a number of threats. Among the most common threats to the Mojave population of the desert tortoise are collection for food, pets, commercial trade, and medicinal uses, as well as the Mojave population of the desert tortoise being struck and killed by on-and-off road vehicles. Illegal shooting is another significant source of mortality in the Mojave population of the desert tortoise. Berry (1990) found that between 1981-1987, 40 percent of the desert tortoises found dead on a study plot in Freemont Valley, California, had been killed by gunshot or by off-road vehicles. Predation is another factor implicated in population declines of the desert tortoise. Predation by common ravens has become a major threat to desert tortoise populations in some areas. Ravens are known to prey on juvenile desert tortoises from 1.3 to 4.9 inches in length (Berry 1985). Between 1968 and 1992, raven populations in the Mojave Desert have increased by more than 1,000 percent due to the increase in resource subsidies (e.g., food, water, nesting substrate) that are provided by increasing human populations (Boarman and Berry 1995). Elevated perches are typically scarce in the Mojave Desert, and such manmade substitutes provide perching sites for predatory birds. Farrell (1989) documented ravens utilizing power line towers for perches while consuming juvenile desert tortoises (USFWS 1994). Human predation in the form of highway mortality and illegal removal of adult desert tortoises for pets are also factors in the decreasing numbers of desert tortoises (USFWS 1994; Lovich 1999). Desert tortoises will urinate in response to harassment and this jeopardizes the survival of desert tortoises through the summer due to water loss. An upper respiratory tract disease, discovered in 1990, is currently a major cause of mortality in the western Mojave Desert population of the desert tortoise. Predisposing factors, such as habitat degradation, poor nutrition, and drought, have only served to compound the problem (USFWS 2011). Habitat destruction, degradation, and fragmentation are also threats. Over the last 150 years, there have been substantial decreases in perennial grasses and native annuals and an increase in exotics, which serve as fire hazards. Perennial shrubs and grasses used for cover and food have been diminished and have been replaced by inedible exotic ephemerals. Also, as the habitat becomes increasingly fragmented, desert tortoises are forced to forage over larger areas and are thus exposed to greater dangers. Finally, grazing by domesticated animals damages the soil, reduces water filtration, promotes erosion, and invites invasion by exotic vegetation (USFWS 1994). Invasion by exotic plants can have a significant negative impact on desert tortoises due to changes in the native plant community. Red brome, for example, a European import, competes with native perennial grasses, shrubs, and annuals. Recurrent fires due to presence of exotic ephemerals such as red brome can reduce the abundance and diversity of native forbs on which the desert tortoises depend (National Park Service 2001).The increased fires also aggravate habitat fragmentation, which is a major contributor to tortoise population declines (USFWS 1994).

4.2.4 Protocol Survey Methodology

The desert tortoise survey methodology employed was designed to determine presence/absence and abundance of desert tortoises within the Action Area. The survey methodology is the Pre-project Field Survey Protocol for Potential Desert Tortoise Habitats (USFWS protocol) described in the Preparing For Any Action That May Occur Within The Range Of The Mojave Desert Tortoise (Gopherus agassizii; USFWS 2010). The information gathered by the survey methodology is intended to:

1. Determine the appropriate level of consultation with the U.S. Fish and Wildlife Service (USFWS) and Nevada Department of Wildlife (NDOW);

2. Determine the amount of incidental take of Desert Tortoises resulting from the Project as defined by the Endangered Species Act (ESA) and state laws; and

3. Assess the distribution of Desert Tortoises to help minimize and avoid take.

Based on the most recent USFWS protocol (USFWS 2010), a site assessment is conducted within the survey area to determine the suitability of the habitat for Desert Tortoise. Pursuant to the protocol, if the survey area is large (> 40 acres), surveys should be conducted during the Desert Tortoise's most active periods (April through May or September through October) when air temperatures are lower than 104F. The USFWS guidance also indicates that projects smaller than 2,789 acres that are located within the North-East Mojave - North Recovery Unit must complete 100% coverage surveys. Therefore, probabilistic sampling was not an option for the Project, so ten-meter wide belt transects were used during the survey and were designed to cover the entire Action Area (100 percent coverage; Heritage 2013; Appendix A). The sampling protocol implemented for this survey was reviewed and approved by the USFWS prior to implementation. Occurrences of either live desert tortoises or desert tortoise sign in the survey area were used to indicate desert tortoise presence. The Project site, transmission line ROWs, water pipeline, and access road ROWs were surveyed with ten-meter transects ensuring 100 percent coverage of those areas. If neither actual desert tortoises nor sign thereof were encountered during the surveys in any given portion of Project (e.g., a particular transmission interconnection corridor), three additional 10-m belt transects at 200-m intervals parallel to and/or encircling the Action Area perimeter (200-m, 400-m, and 600-m from the perimeter of the Project site) were also surveyed. These transects were used to determine the presence/absence of desert tortoise, but the transects were not included in the estimation of desert tortoise abundance.

Three separate desert tortoise surveys were conducted. The first survey took place in May of 2010 and surveyed the SPGF, access road, and the 230-kV gen-tie transmission option. The first survey is now out of date and incomplete, and the methods described below refer only to the second and third surveys conducted on the site.

The second survey took place in May of 2012 and surveyed the SPGF, access road and gen-tie transmission lines. The third survey was conducted in October of 2012 that surveyed the water pipeline. All observed desert tortoise sign was mapped and recorded. Sign included scat, burrows, live tortoises, carcasses, shell fragments, eggshells, tracks, courtship rings, and drinking depressions. Desert tortoise population estimates were generated based on recommended methodologies contained in USFWS (2010). These estimates were generated for all Project components for which there were detections of adult desert tortoise.

Population estimates were generated using the following equation:

n

(

A)

N^

=

\*

(

Pa

)(

Pd

)

(a

)

Where

N

is the corrected population estimate,

n

is the number of Desert Tortoises observed,

Pa

is the probability a Desert Tortoise in the Action Area would be above ground based on previous winter precipitation per USFWS (2010). For the "Table 3" calculation of the May 2012 Project survey and the October 2012 survey, a value of 0.8 was used (Western Regional Climate Center 2012),

Pd

is the probability that an above-ground Desert Tortoise would be detected (0.63),

A

is the size of the Action Area, and

a

is the size of the area surveyed. Corrected estimates are reported here with 95% confidence intervals (CI) per USFWS (2010).

4.2.5 Protocol Survey Results

The following sections discuss the results of the 2012 surveys.Results of the 2010 surveys are out of date (since survey results expire after one year). Most of the Action Area represents potentially suitable habitat for the desert tortoise. The Action Area is largely dominated by Mojave creosote-bush scrub vegetation. The Mojave creosote-bush scrub vegetation class includes Mojave mixed scrub and creosote-bursage vegetation. Dominant species associated with the Mojave creosote-bush scrub vegetation community include shadscale (Atriplex confertifolia), brittlebrush (Encelia farinosa), creosote (Larrea tridentata), bursage (Ambrosia dumosa), and desert saltbush (Atriplex polycarpa) that occur on lower slopes and in washes. Associate species also included Mojave yucca (Yucca schidigera), Mormon tea (Ephedra nevadensis), range ratany (Krameria parvifolia), desert trumpet (Eriogonum inflatum), big galleta (Hilaria rigida), and Indian ricegrass (Oryzopsis hymenoides).

The portion of the 230-kv gen-tie transmission route to the Harry Allen Substation (approximately 1.7 miles in length) that traverses Dry Lake is not suitable desert tortoise habitat and was not surveyed. This part of Dry Lake was almost completely unvegetated with hard-packed soils, often with an alkali crust. Based on the lack of vegetation, there is no forage or cover present for desert tortoises. This portion of Dry Lake is also occasionally completely inundated; precluding desert tortoises from occupying burrows. Small portions of the Dry Lake area were spot sampled - suitable burrows were not found, nor were soil conditions conducive for burrow excavation. The vegetated margins of the lake bed were surveyed since the vegetated margins represented potentially suitable foraging areas; though soils in the vegetated margins were still extremely hard packed.

Near the south end of the transmission interconnection, the habitat becomes steeper with rockier soils and greater components of cholla (Cylindropuntia sp.), Mojave yucca and prickly pear (Opuntia sp.). The rocky habitat is crossed by several small ephemeral drainages originating from a large sloping bajada extending from the southwest. Desert tortoises and desert tortoise sign were observed in the Action Area. An adult desert tortoise and suitable desert tortoise burrows were observed within the SPGF; desert tortoise sign and potentially suitable burrows were observed along the 230-kV gen-tie transmission line; an adult desert tortoise and potentially suitable burrows were observed along the buffer transects associated with the 500-kV gen-tie transmission line; one potentially suitable burrow occurred along the access road, two adult desert tortoises and one subadult desert tortoise and fourteen suitable burrows were observed along the pipeline ROW.

Observation Description Legend (! Class 1 Burrow Interstate (! Class 1/2 Burrow Railroad (! Class 2 Burrow 13 18 17 16 15 14 Proposed Access Road (! Class 3 Burrow (! Class 5 Burrow Water Pipeline (! Desert Tortoise WP 15 ! ! ! ! Option A to Harry Allen (! Shell Fragments (! Substation &/$5.&2817 0.5 1 Miles Universal Transverse Mercator North American Datum 1983 Zone 11 North, Meters 34 35 33 36 31 32 Moapa Solar Energy Center (! WP 16 ! ! ! ! ! ! ! ! ! ! )LJXUH:DWHU3LSHOLQH 'HVHUW7RUWRLVH2EVHUYDWLRQV ! ! ! ! ! 07 ! 11 ! Proposed Solar ! Township 17S 12 Map Extent: Clark County, Nevada 10 ! 08 09 15 Site Boundary ! ! Range 64E ! Date: 11-20-12 Author: rnc ! ! I:\Moapa Solar/MXD's/Water Pipeline DTObservations\_112012.mxd

Description of Species MSEC Biological Assessment Table 2a - Desert Tortoise Sign and Observations.May 2012 Survey Observation Transect Project Component GPS ID Notes Description1 Solar Power Generating 1 Class 4 burrow SF001 Facility Solar Power Generating 6 Class 5 burrow SF002 Facility Solar Power Generating 10 Class 3 burrow PG003 Scat present Facility Solar Power Generating 12 Class 3 burrow SM001 Scat present Facility Tortoise not in Solar Power Generating 14 Desert Tortoise PG004 burrow; 280mm Facility MCL Solar Power Generating Egg fragments 19 Class 3 burrow PG006 Facility present; in wash Solar Power Generating Located in small 20 Class 6 burrow PG005 Facility rivulet Solar Power Generating 21 Class 4 burrow SF004 Facility Solar Power Generating Class 6 burrow TM001 No sign Facility 23 Solar Power Generating Class 4 burrow TM002 Scat present Facility Solar Power Generating 32 Class 6 burrow SY001 Facility Solar Power Generating 38 Class 3 burrow SF005 Facility Solar Power Generating 40 Class 4 burrow SM003 Facility Solar Power Generating 43 Class 4 burrow PG007 No sign Facility Solar Power Generating 45 Class 3 burrow SF006 Facility Solar Power Generating 62 Class 4 burrow SY002 Facility 40 | P a g e Description of Species MSEC Biological Assessment Solar Power Generating 70 Class 3 burrow SM004 Creosote flat Facility Solar Power Generating 85 Class 6 burrow PG008 Partially filled in Facility Solar Power Generating 115 Class 4 burrow PG009 Near coyote den Facility Solar Power Generating 116 Class 6 burrow SY003 Facility No sign; near Access 400W Access Road Class 5 burrow PG011 rivulet 500-kV Transmission Class 5 burrows Two burrows; no Crystal 400N PG012 Line (buffer) (x2) sign Desert tortoise in 500-kV Transmission Crystal 600N Desert Tortoise SFDT01 burrow; 250mm Line (buffer) MCL Estimated time 230-kV Transmission Shell fragments HA1 TM003 since death: >4 Line - Option A and scutes years Estimated time 230-kV Transmission HA1 Shell fragments TM004 since death: >4 Line - Option A years 230-kV Transmission Very fresh sign HA2 Class 1 burrow SY004 Line - Option A at entrance 230-kV Transmission HA3 Class 3 burrow PG010 Shell fragments Line - Option A 230-kV Transmission HA4 Class 5 burrow CB001 Line - Option A 230-kV Transmission HA4 Class 3 burrow CB002 Line - Option A 230-kV Transmission No sign; upper HA5 Class 3 burrow SM005 Line - Option A bajada 230-kV Transmission No sign: upper HA5 Class 3 burrow SM006 Line - Option A bajada near wash 41 | P a g e Description of Species MSEC Biological Assessment Table 2b - Desert Tortoise Sign and Observations. Oct. 2012 Survey Observation Transect Project Component GPS ID Notes Description1 Subadult. Not in 1 Pipeline Desert Tortoise WP 09 burrow 2 Pipeline Class 3 burrow WP 01 No sign 2 Pipeline Class 2 burrow WP 02 No sign 2 Pipeline Class 3 burrow WP 03 No sign 2 Pipeline Class 2 burrow WP 04 No sign 2 Pipeline Class 1-2 burrow WP 05 Tracks 2 Pipeline Class 2 burrow WP 06 No sign 2 Pipeline Class 3 burrow WP 07 No sign 2 Pipeline Class 5 burrow WP 08 No sign 3 Pipeline Class 2 burrow WP 18 No sign 3 Pipeline Class 2 burrow WP 17 No Sign 3 Pipeline Shell Frags WP 16 Carcass Adult.

Note: The text primarily consists of tabular data with observational notes. The task of identifying and replacing pronouns in such data is minimal because the data does not contain many anaphoric pronouns referring back to previously mentioned noun phrases. The text mostly lists observations, making coreference resolution largely unnecessary.Not in 4 Pipeline Desert Tortoise WP 10 Burrow Adult. Not 4 Pipeline Desert Tortoise WP 15 completely in burrow. 5 Pipeline Class 1 burrow WP 11 Scat. 5 Pipeline Class 3 burrow WP 12 No sign. 5 Pipeline Class 1 burrow WP 13 No sign. 5 Pipeline Class 2 burrow WP 14 No sign. 1 Burrow Class 1 - Definitely Desert Tortoise - Fresh; Class 2 - Definitely Desert Tortoise - Not Fresh But Active This Season/Year; Class 3 - Definitely Desert Tortoise - Good Condition But Not Active This Season/Year; Class 4 - Possibly Desert Tortoise - Good Condition But Unsure of Species; Class 5 - Definitely Desert Tortoise - Deteriorated (Not This Season/Year); Class 6 - Possibly Desert Tortoise - Deteriorated. 42 | P a g e

"Description of Species MSEC Biological Assessment As detailed in the 2010 USFWS protocol, corrected desert tortoise estimates are calculated upon completion of the field surveys. These calculations were performed using the USFWS interactive "Table 3," included in the 2010 Pre-project Survey Protocol (USFWS 2010). Table 3 calculates desert tortoise populations based on the number of adult tortoises observed during surveys, as described above. Results from the May 2012 "Table 3" calculations indicate approximately 2.0 Desert Tortoises are expected to occupy the SPGF site (95%CI: 0.36-10.64). Results from the October 2012 "Table 3" calculations indicate approximately 6.8 Desert Tortoises are expected to occupy the pipeline ROW (95%CI: 1.98-23.11). Accurate estimates of numbers of juvenile tortoises or tortoise eggs are difficult to make and involve uncertainty. Turner et al. (1987) estimated that juvenile and hatchling tortoises accounted for 19 to 81 percent of the overall population. If this assumption is used, the expected number of juvenile and/or hatchling tortoises expected on the SPGF would be between 0.44 and 56.00; the expected number of juvenile or hatchling tortoises within the water pipeline ROW would be between 2.44 and 121.63. During May and June, the project area would be expected to contain desert tortoise eggs. Assuming a 1:1 sex ratio, there are between 0.36 and 10.64 female tortoises in the SPGF and 1.98 and 23.11 female tortoises in the pipeline ROW. Female tortoises lay an average of 1.6 clutches per year (Turner et al. 1984) and each clutch contains an average of 5.38 eggs (Turner et al. 1986). Thus, between 1.64 and 45.79 eggs would be expected within the SPGF and between 8.52 and 99.50 eggs would be expected within the pipeline ROW. Desert tortoises are expected to be present along the proposed access road and all transmission alternatives (both 500-kV route as well as 230-kV routes) based on the presence of sign and/or suitable burrows, though population estimates along these routes are not possible because adult desert tortoises have not been detected. An adult desert tortoise was observed in the buffer area associated with the 500-kV Transmission Line alternative; however, adult desert tortoises located in buffer areas are not used to generate relative abundance estimates. Critical Habitat: No designated critical habitat exists within the Action Area. The closest critical habitat for the desert tortoise is located approximately 4.5 miles west of the Action Area on the west slope of the Arrow Canyon Range.

Moapa Dace:

Species Description: The Moapa dace (Moapa coriacea) occurs in the Muddy River system and is listed as endangered under the ESA. Since the Moapa dace represents a monotypic genus, the Moapa dace was assigned a recovery priority of 1 (highest ranking) by the USFWS in 1995. The original recovery plan for the Moapa dace was prepared in 1983 and subsequently revised in 1995. The Moapa dace was first discovered in 1938 (Hibbs and Miller 1948). The maximum size for the Moapa dace is approximately 4.7 inches. Moapa dace have been recorded living as long as four years.43 | P a g e

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4.3.2 Distribution and Life History

The Moapa dace is endemic to the upper Muddy River and the Moapa dace's tributary thermal springs. Originally, this species may have inhabited up to 25 spring systems in the Warm Springs area and as much as 10 miles of stream habitat within the Moapa River. The Moapa dace inhabits a variety of habitats throughout the Moapa dace's 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 Moapa River, whereas adults can be found in the river's mainstem. The species prefers warmer temperatures (67-89.6F), and cooler temperatures in the middle portion of the Moapa River mainstem may function as a barrier to downstream movements (USFWS 1996). The species is omnivorous; stomach contents of the Moapa dace 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 (Scoppettone et al. 1987, 1992). The Moapa 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 where the Moapa dace forages are often characterized by overhanging vegetation or particularly deep areas (USFWS 1996).

4.3.3 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. Two impoundments constructed within the Moapa River have altered habitats on both sides of the dam/weir and present barriers to movement. These barriers have the effect of creating genetic isolation in two stretches of the river (upstream and downstream of Nevada Power Company diversion dam; and upstream and downstream, of the Bureau of Reclamation's Cipoletti weir gaging station). Several species of non-native fishes have been introduced to the Moapa River. These non-native fishes may compete with Moapa dace, may prey directly on the Moapa dace, and/or may spread parasites to the Moapa dace. Non-native species include the mosquitofish (Gambusia affinis), shortfin mollies (Poecilia mexicana), common carp (Cyprinus carpio), channel catfish (Ictalurus punctatus), largemouth bass (Micropterus salmonoides), green sunfish (Lepomis cyanellus), red shiner (Cyprinella lutrensis), fathead minnow (Pimephales promelas), black bullhead (Ameiurus melas), blue tilapia (Tilapia aurea) and Koi (C. carpio domestic var.).

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5 Effects of the Action

The below sections will discuss the direct, indirect and cumulative impacts of the proposed action upon the desert tortoise and Moapa dace. Impacts resulting from the implementation of the Proposed Action include:

- Incidental take of desert tortoises;

- Temporary stress on desert tortoises from handling during relocation efforts;

- Constriction of movement corridors for desert tortoise;

- Disturbance from vibration during construction that could affect desert tortoise in burrows near the boundary of the Action Area;

- Temporary or permanent loss of desert tortoise habitat and burrows along and within the Action Area;

- Disturbance and displacement of desert tortoise during construction of the associated access roads, gen-tie transmission routes and water pipeline;

- Potential noise and lighting effects on desert tortoise behavior and movement;

- Introduction of weeds and invasive species within the buffer area of the Action Area boundary during construction and operation, and therefore affects to desert tortoise; and

- Potential increases in ravens and other predators of desert tortoise occupying adjacent lands as a result of perches provided by the solar structures, transmission lines and 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 Moapa dace (incremental or additive effects).5.1 Desert Tortoise

5.1.1 Estimate of Incidental Take

A federal take of a species listed pursuant to the federal ESA is defined as "Take - to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct" (50 CFR 17.3). An estimated 8.8 adult desert tortoise (95% CI = 2.34-33.75) occur within the Action Area (based on 2010 USFWS protocol calculations). In addition to adult tortoise, between 2.88 and 177.63 juvenile and/or hatchling tortoise are estimated to occur within the project area and an estimated 15.38 to 356.67 eggs are estimated to occur within the project area during May and June. For planning purposes, construction of the Proposed Action may result in the take of up to 34 (33.75) adult desert tortoise and 178 (177.63) juvenile/hatchling tortoise through harassment, direct mortality, and impacts on desert tortoise habitat. If initial ground disturbing activities take place during May and/or June, the proposed action could result in the take of up to 357 (356.67) desert tortoise eggs. Desert tortoise exclusion fencing will be installed prior to construction, and desert tortoise will be relocated via clearance surveys before the construction phase of the project. Relocation of desert tortoise 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. Desert tortoise will be relocated to BLM managed lands or Tribal lands immediately adjacent to the Action Area. Based on the tortoise estimates derived from the most recent survey data, a translocation plan for the project may be needed. It is expected that most tortoises will be able to be captured and safely released outside the exclusion fence adjacent to the project site, but there may be a few individual tortoises that need to be moved to a recipient site, if needed. The project would use the same recipient site used for the K Road project, if a translocation plan is deemed necessary for the project. The K Road translocation plan would be adapted for this project. Beside the initial construction, the use of the site access road as well as operation and maintenance activities outside the SPGF fenceline could represent a source of ongoing mortality. No tortoises were located along the access road, and biological monitors would accompany all activities occurring outside the SPGF fenceline. As such, direct take of desert tortoise resulting from these activities is expected to be very low.

5.1.2 Loss of Occupied Habitat

The Proposed Action includes the installation of permanent desert tortoise exclusion fencing along the entire SPGF boundary (approximately 4.6 miles), utilizing gates and cattle guards (with ramps) at ingress/egress locations. A total of approximately 880.2 acres of occupied desert tortoise habitat would be permanently disturbed and up to approximately 65.1 acres would be temporarily disturbed as a result of project implementation (Table 3). Because recovery of vegetation in the desert can take decades or longer, the USFWS considers all ground-disturbing impacts associated with the proposed project to be long-term/permanent. Therefore, total long-term disturbance of occupied desert tortoise habitat from the project would be approximately 945.7 acres. Approximately 847.4 acres of the SPGF are considered suitable desert tortoise habitat. The SPGF would be fenced to exclude desert tortoise and would be considered a permanent loss of habitat for the species. Other permanent impacts are associated with the 2.5-mile access road (approximately 14.9 acres), and gen-tie transmission pole locations and access roads (approximately 44.3 acres for the 230-kV option and 16.5 acres for the 500-kV option). Disturbance acreages are described in Table 3. Construction equipment will not operate beyond the fenced boundary with the exception of the access road and the gen-tie and pipeline ROWs. Roads 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. Temporary loss (though it is considered permanent in this Biological Assessment) of desert tortoise habitat may result from the construction of the proposed 3.5-mile water pipeline, the 1.5-mile 500-kV line, and the 7.5-mile 230-kV lines. The water pipeline would be installed using trenching techniques that may impact existing burrows. This may be only a temporary loss given that the pipeline would be buried; however, vegetation re-growth over the pipeline would be slow.It is assumed that a 50-foot wide construction ROW would be utilized. A loss of desert tortoise habitat on approximately 22.1 acres would occur within the water pipeline ROW; however, no overall loss to desert tortoise territory would occur as a result of the construction of the pipeline. Similarly, the gen-tie transmission lines would most likely be constructed using direct burial of steel or wooden poles. The pole locations could directly affect existing desert tortoise burrows as well as impacts from access roads and construction vehicles. A loss of desert tortoise habitat would occur for temporary work areas associated with both the generation-tie transmission line options. Approximately 13.2 acres would be temporarily disturbed under the 500-kV option (includes construction areas and pull sites), while approximately 29.8 acres would be temporarily disturbed under the 230-kV option (includes construction areas and pull sites). These acreages were previously included in disturbance acreages of 44.3 acres and 15.6 acres cited above. Project impacts are described in Table 3. 46 | P a g e.

Effects of the Action MSEC Biological Assessment Table 3 - Impacts from the Proposed Action to Desert Tortoise Habitat Long-Term Temporary Total Project Component Covertype Impacts Impacts Impacts (acres) (acres) (acres) Creosotebush-White Bursage 817.6 0.0 817.6 Solar Site Xeroriparian 29.8 0.0 29.8 TOTAL 847.4 0.0 847.4 Cactus/Yucca 3.3 0.0 3.3 Creosotebush-White Bursage 2.6 0.0 2.6 230kV Pole Saltbush 0.7 0.0 0.7 Structures Xeroriparian 0.1 0.0 0.1 TOTAL 6.7 0.0 6.7 Cactus/Yucca 3.6 0.0 3.6 Creosotebush-White Bursage 3.0 0.0 3.0 230kV 12ft Saltbush 0.8 0.0 0.8 Road 230kV Gen- Xeroriparian 0.4 0.0 0.4 Tie TOTAL 7.8 0.0 7.8 Cactus/Yucca 0.0 13.1 13.1 Creosotebush-White Bursage 0.0 10.4 10.4 230kV Construction Saltbush 0.0 2.8 2.8 Area Xeroriparian 0.0 0.8 0.8 TOTAL 0.0 27.1 27.1 Creosotebush-White Bursage 0.0 1.4 1.4 230kV Pull Cactus/Yucca 0.0 1.3 1.3 Site TOTAL 0.0 2.7 2.7 Creosotebush-White Bursage 1.1 0.0 1.1 500kV Pole Xeroriparian 0.2 0.0 0.2 Structures TOTAL 1.2 0.0 1.2 Creosotebush-White Bursage 2.1 0.0.2.1 500kV 12ft Xeroriparian 0.0 0.0 0.0 Road 500kV Gen- TOTAL 2.1 0.0 2.1 Tie Creosotebush-White Bursage 0.0 6.2 6.2 500kV Construction Xeroriparian 0.0 0.2 0.2 Area TOTAL 0.0 6.4 6.4 500kV Pull Creosotebush-White Bursage 0.0 6.8 6.8 Site TOTAL 0.0 6.8 6.8 Creosotebush-White Bursage 13.4 0.0 13.4 Proposed Access Road Xeroriparian 1.6 0.0 1.6 TOTAL 15.0 0.0 14.9 47 | P a g e

526 Effects of the Action MSEC Biological Assessment Long-Term Temporary Total Project Component Covertype Impacts Impacts Impacts (acres) (acres) (acres) Creosotebush-White Bursage 0.0 21.4 21.4 Water Pipeline Xeroriparian 0.0 0.7 0.7 TOTAL 0.0 22.1 22.1 PROJECT TOTALS 880.2 65.1 945.7 \*Acreage estimates were rounded independently - totals may not sum exactly. \*\*Table includes all habitats present within the MSEC project area except disturbed, playa lake and mesquite which do not represent suitable habitat for the desert tortoise. 5.1.3 Constriction of Movement The Proposed Action is currently located in an area where desert tortoise movement is generally unrestricted. Topography in the area is gently sloping to rolling with no major barriers to movement. The extensive disturbance in the vicinity resulting from the numerous transmission lines, access roads, pipelines, substation and power generation facilities may affect desert tortoise movement via avoidance during construction, but generally do not directly restrict desert tortoise movement (with the exception of the substations and power generation facilities which actively exclude desert tortoises). Interstate 15 to the east and the Arrow Canyon Range likely represent barriers to movement out of the Dry Lake Valley to the east or west. North and/or south movement within the valley is generally unrestricted. Exclusionary fencing would be installed around the perimeter of the entire SPGF in order to exclude desert tortoises. The exclusionary fencing would restrict desert tortoise movement on the site but would not preclude north-south movement through the Dry Lake Valley. No permanent exclusionary fencing would be used on the access road, gen-tie transmission lines, or water pipeline. These areas would experience temporary disturbance that could affect desert tortoise movement but would not directly restrict desert tortoise movement. 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. Once exclusion fencing has been installed and clearance surveys completed, biological monitors would not be required. 5.1.4 Vibration Equipment that will cause surface disturbance and otherwise operate during construction will be limited to what equipment would be needed to develop dirt access roads that are generally at landform grades, equipment to install solar arrays and poles, trenching equipment for installation of cable and wiring and equipment to install the small operations building and the proposed electric substation. Areas outside of the exclusion fence may experience short-term vibrations that could potentially disturb desert tortoise. Vibration is unlikely to be noticeable farther than a few tens of feet beyond the source of the vibration. Construction taking place near the perimeter edge of the exclusion fence is limited. Activity during operations will be substantially less than during construction of the Proposed Action, such that no adverse effects from ground vibration on desert tortoise are expected to occur during operation of the Proposed Action. 5.1.5 Dust Construction activities and operational vehicle traffic on the roads within the Action Area could generate dust that would affect vegetation adjacent to the Action Area in the short-term; long-term adverse effects 48 | P a g e

527 Effects of the Action MSEC Biological Assessment 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 tortoise. 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.5.1.6 Noise

Noise sources around the Proposed Action include road traffic (I-15), railroad traffic (Union Pacific Railroad), aircraft flyover (primarily from Nellis Air Force Base in North Las Vegas), and industrial activities (Harry Allen Generating Station). On the basis of the rural nature of the area and low population density, the day-night average noise level (Ldn or DNL) is estimated to be within the range of 33 to 47 dBA Ldn typical of a rural area (Eldred 1982; Miller 2002). Noise measurements and analyses were conducted for the nearby K Road Solar Project in 2011. The noise measurements (Ldn, A-weighted) indicated an Ldn of 54.4 dBA and a 24 hour Leq of 50.4 dBA. Because the proposed MSEC Project is further away than the K Road solar project from most noise sources, it can be assumed that overall noise levels will be lower than the noise levels identified for the K Road Solar Project. The MSEC Project operation will generate an increase in ambient noise of 10 to 20 dBA. The amount of noise during operation will not represent a significant change from the current ambient levels. Noise generated during construction is not a significant change from existing conditions near the interstate and the railroad, but does represent an increase at locations furthest from these sources towards the western border of the SPGF. Desert tortoises outside of the proposed solar facility boundary may be tolerant of noise, given desert tortoise home range and vicinity to the interstate and railroad, and therefore, resident nearby and adjacent individuals are not expected to be substantially affected by temporary construction noise levels.

5.1.7 Lighting

The Project's lighting system will provide operation and maintenance personnel with illumination for both normal and emergency conditions near the main entrance and the Project substation. The lighting system will be designed to provide the minimum illumination needed to achieve safety and security objectives and will be downward facing and shielded to focus illumination on the desired areas only. There will be no lighting in the solar field. Therefore, light trespass on surrounding properties will be minimal. If lighting at individual solar panels or other equipment is needed for night maintenance, portable lighting will be used. Project lighting is not expected to have a more than negligible effect on desert tortoises near and adjacent to the Proposed Action.

5.1.8 Edge Effects

The edge effect is the effect of the juxtaposition or placing side by side of contrasting environments on an ecosystem. The edge effect term is commonly used in conjunction with the boundary between natural habitats and disturbed or developed land. The Proposed Action includes placement of a permanent exclusionary fence along the SPGF boundary. Other than impacted burrows or desert tortoises that need to be relocated during fence construction, the assumption is that there will be no permanent or long term edge effects as a result of the Proposed Action. The exclusionary fence may create roosting sites for ravens or birds of prey; roosting site effects would be mitigated through the preparation and implementation of a Raven Control Plan (see Section 5.1.10).

5.1.9 Introduction of Weeds and Invasive Species

Introduction of weeds and invasive species to the Proposed Action and surrounding area will be controlled using a weed management plan. The weed management plan will prevent 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. The weed management plan will identify management and operational practice to avoid the introduction or spread of existing invasive species within the Action Area. The goal of the weed management 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 the weed management plan would result in no adverse effects on desert tortoises from weeds or invasive species within the Action Area or on adjacent lands.

5.1.10 Attraction of Human Subsidized Predators

Avian predators and scavengers such as the common raven (Corvus corax) 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 et al. 2006). These subsidies can include food (e.g., garbage), water (e.g., detention ponds), nesting substrates (e.g., transmission lines and fencing), and safety from inclement weather or predators (e.g., office buildings). Ravens and other predators may be attracted to elevated structures associated with the Proposed Action such as the perimeter fencing, transmission line and poles, and operational buildings onsite.There is a potential for increased sources of food or water both during construction and operation of the project, particularly at facilities where people will concentrate; however, agency approved Bird and Bat Conservation Strategy (BBCS) and Raven Control Plans (RCP) were developed and will be approved prior to the initiation of construction activities, which will reduce or eliminate potential raven (or other avian predators) related impacts to the desert tortoise. Education regarding control of food/trash sources and minimization of water resources and potential 'perching' areas is the main focus of the plan.

5.1.11 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 signs (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 desert tortoise, temporary and permanent disturbance to desert tortoise habitat would occur. Based on all of the foregoing, it is concluded that the project is likely to adversely affect the desert tortoise. However, the project would not jeopardize the continued survival or future recovery of the desert tortoise.

5.2 Moapa Dace The Moapa dace is only known to occur in the Muddy River and several associated headwater springs in the Warm Springs area. The headwater springs represent the primary water source for the Muddy River to which Moapa dace is endemic. The Proposed Action would include the withdrawal of up to 30 acre-feet per year (afy) from the EC-1 well, approximately 12 miles north of the project. Groundwater withdrawals represent the only potential effect to Moapa dace from the Proposed Action.

5.2.1 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. Historic flow records indicate that about 51 cubic feet per second (cfs) of groundwater discharge sustain the spring and river flows. Currently, consumptive uses related to natural evapotranspiration, surface-water diversions, and groundwater diversions reduce the Muddy River flows to about 25,000 afy (35 cfs) at the Warm Springs Road gaging station, which is located about 3 km downstream of the spring area. Thus, about 32% (12,000 afy) of the regional flux to the area is consumptively removed from the system above the gage. Of this amount, about 3,600 afy (~25%) is estimated to be lost by evapotranspiration from the well-vegetated areas of the headwater channels and springs, and the rest is removed through pipelines by Moapa Valley Water District (MVWD) and Nevada Power Company (NPC) for use elsewhere. Several groundwater models were created to predict the range of potential impacts resulting from the withdrawal of up to approximately 30 afy at the EC-1 well. Several regional groundwater scenarios may be possible based on current uncertainty about connectivity between portions of the field and the role of adjacent areas on the edges of the field. The various models were used to predict the various potential scenarios that could arise given these uncertainties. The models used 2001 flows as the model baseline (40.5 cfs). Estimates of flow reduction ranged from a 0.006% reduction in 10 years (0.036% reduction in 75 years) to a 0.008% reduction in 10 years (0.073% reduction in 75 years). Experimental and observation evidence suggest that the model predicting the lowest impacts is likely the most plausible. Thus, for the purposes of this analysis, the values of 0.006% in 10 years/0.036% in 75 years will be used. The flow reductions would result in flows in the Muddy River of 40.26 cfs in 10 years (39.04 cfs in 75 years), compared to the baseline flow of 40.5 in 2001. 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 Investment (CSI), the Tribe, and the United States Fish and Wildlife Service (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 Memorandum of Agreement (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 acre-feet (aft) of groundwater from the two basins. On January 20, 2006, the U.S. Fish and Wildlife Service (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 (Programmatic Biological Opinion; PBO). The MOA and the programmatic biological opinion include the following conservation measures: 1. Implement restoration of Moapa dace habitat on the USFWS's Apcar Unit of the Moapa Valley National Wildlife Refuge (MVNWR); 2. Develop a Recovery Implementation Program (Recovery Program), which will be used to effectuate the goals of the MOA by implementing measures necessary to accomplish the protection and promote the recovery of the Moapa dace, as well as, outline the development of regional water facilities and include additional parties as appropriate. The Recovery Program will be developed for the purposes of continuing to identify the key conservation actions that, when implemented, would continue to contribute to offset any pumping impacts that may result from groundwater pumping; 3. Assist in developing an ecological study designed specifically to determine effects of groundwater pumping on the Moapa dace and other aquatic dependent species in the Muddy River system; 4. Construct fish barriers in order to prevent additional non-native fishes from migrating into Moapa dace habitat; 5. Eradicate non-native fish, such as tilapia from the historic range of Moapa dace; 6. Restore Moapa dace habitat outside the boundary of the MVNWR; 7. Provide the use of the Tribal greenhouse to cultivate native plants for restoration actions in the Muddy River area; 8. Provide access to Tribal lands for the construction and maintenance of at least one fish barrier; 9. Dedication of an existing 1.0 cubic feet per second (cfs) Jones Spring water right (Moapa Valley Water District; MVWD) towards establishing and maintaining in-stream flows in the Apcar tributary system that empties into the Muddy River as outlined in Attachment B; and Dedication of 460 acre-feet per year (afy) of water rights (portion of Coyote Springs Investment; CSI appropriated water rights) to the survival and recovery of the Moapa dace, in perpetuity. In addition, minimum in-stream flow levels were also established in the MOA that trigger various conservation actions should those predetermined levels be reached. The flow levels will be measured at the Warm Springs West Flume located on Moapa Valley National Wildlife Refuge. These automatic actions are identified in the MOA and are summarized below: 1. Should the water flows reach 3.2 cubic feet per second (cfs), the signatories will meet to discuss the issue and compare/evaluate hydrology data; 2. Should the water flows reach 3.0 cfs, during the pendency of the pump test, the Arrow Canyon well will shut down and the Southern Nevada Water Authority (SNWA) will provide the Moapa Valley Water District with the sufficient water quantity necessary to meet Moapa Valley Water District's municipal demands. In addition, SNWA and Coyote Springs Investment will take necessary actions to geographically redistribute groundwater pumping in Coyote Springs Valley if flows levels continue to decline; 3. Should the water flows reach 3.0 cfs or less but greater than 2.9 cfs, SNWA and Coyote Springs Investment will restrict groundwater pumping from MX-5 and RW-2 wells, and CSI Well #1 (Permit 70430) and CSI Well #2 (Permit 70429) and other wells in Coyote Spring Valley, in combination, to 8,050 afy; 4. Should the water flows reach 2.9 cfs or less but greater than 2.8 cfs, SNWA and Coyote Springs Investment will restrict groundwater pumping from MX-5 and RW-2 wells, and CSI Well #1 (Permit 70430) and CSI Well #2 (Permit 70429) and other wells in Coyote Spring Valley, in combination, to 6,000 afy, and the Tribe will restrict the Tribe's pumping (under permit number 54075) in the California Wash basin to 2,000 afy; 5.Should the water flows reach 2.8 cfs or less but greater than 2.7 cfs, SNWA and CSI will restrict groundwater pumping from MX-5 and RW-2 wells, and CSI Well #1 (Permit 70430) and CSI Well #2 (Permit 70429) and other wells in Coyote Spring Valley, in combination, to 4,000 afy, and the Tribe will restrict the Tribe's pumping (under permit number 54075) in the California Wash basin to 1,700 afy. Should the water flows reach 2.7 cfs or less, SNWA and CSI will restrict groundwater pumping from MX-5 and RW-2 wells, and CSI Well #1 (Permit 70430) and CSI Well #2 (Permit 70429) and other wells in Coyote Spring Valley, in combination, to 724 afy, and the Tribe will restrict the Tribe's pumping (under permit number 54075) in the California Wash basin to 1,250 afy. 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. The USFWS estimated that the incidental take of Moapa dace at the programmatic level would be a 22-percent loss in riffle habitat and a 16-percent loss in pool habitat. Current monitoring data indicate that the instream flow at the Warm Springs West Flum is 3.4 cfs, which represents a 0.2 cfs reduction in flows since pumping began. As such, no instream flow trigger points have been reached. The Moapa dace will not be directly affected by the construction or operation and maintenance 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 in the total 16,100 analyzed in the 2006 PBO; the 30 afy of withdrawals proposed as part of the MSEC would be included in the previously permitted 2,500 afy. The use of these 30 afy would contribute to ongoing adverse effects to Moapa dace as was analyzed in the 2006 PBO to which this document tiers. Groundwater pumping associated with the Proposed Action "may affect, and is likely to adversely affect" Moapa dace because the withdrawal of 30 afy would contribute to ongoing adverse effects as analyzed in the 2006 PBO.

Cumulative effects are effects resulting from future Tribe, State or private activities, not involving Federal activities that are reasonably certain to occur within the Action Area of the Federal action subject to consultation. Because the Tribe (BIA), BLM and NPS administer much of the land surrounding the Action Area, many of the actions that are reasonably expected to occur would be subject to the requirements of Section 7 consultation. The Tribe has no future projects planned for the area surrounding the Action Area that would not incorporate BIA as the lead agency; therefore, the cumulative effects analysis is not warranted. The implementation of the Proposed Action "may affect, and is likely to adversely affect the desert tortoise". Take would occur in the form of harassment, potential mortality, and loss of occupied habitat. Implementation of a preconstruction survey, biological monitoring, a project-specific RCP, worker environmental awareness training and exclusionary fencing is intended to minimize direct mortality of desert tortoise. Based on the amount of suitable habitat that would be impacted and estimated population based on 100 percent desert tortoise surveys, within the solar facility boundary, up to 24 adult desert tortoise, up to 178 juvenile and/or hatchling desert tortoise and up to 357 desert tortoise eggs and 946.6 acres of potential tortoise habitat may be affected by the Proposed Action (880.5 acres of permanent impacts and 66.1 acres of temporary impacts). Implementation of the Proposed Action is expected to have adverse effects on the Moapa dace. The Proposed Action would contribute to ongoing cumulative effects to this species as was analyzed in the 2006 PBO to which this Biological Assessment tiers.Gopherus agassizii. Unpublished abstract compiled and edited by the Heritage Data management System, Arizona Game and Fish Department, Phoenix, Arizona. 8p. Internet site: http://www.gf.state.az.us/w\_c/edits/documents/Gophagas.fi\_001.pdf. Accessed: February 2011. Boarman, W. I., and K. H. Berry 1995. Common ravens in the southwestern United States, 1968-92. Pages 73-75 in E. L. LaRoe, G. S. Farris, and C. E. Puckett (eds.), Our Living Resources: A report to the nation on the distribution, abundance, and health of U. S. plants, animals, and ecosystems. USDI, National Biological Service, Washington, D.C. 530 p. Benson, L. and R. A. Darrow. 1981. Trees and shrubs of the southwestern deserts. University of Arizona Press. Tucson, AZ. Berry, K.H. 1986. Desert tortoise (Gopherus agassizii) research in California, 1976-1985. Herpetologica 42 (1):62-67. Berry, K.H. 1990 (as amended). The status of the desert tortoise in California in 1989. U.S. Bureau of Land Management, Riverside, California; amended to include data from 1990, 1991, and 1992. Brown, D. E. 1994. Biotic Communities, Southwestern United States and Northwestern Mexico. University of Utah Press, Salt Lake City, UT. Bureau of Land Management (BLM), USFWS, and California Department of Fish and Game. 1989. Environmental Assessment for Selected Control of the Common Raven to Reduce Desert Tortoise Predation in the Mojave Desert, California. Bureau of Land Management, Riverside, California. Bureau of Land Management. 2010. Proposed Pony Express RMP Amendment and Final EIS for the UNEV Pipeline http://www.blm.gov/ut/st/en/prog/more/lands\_and\_realty/unev\_pipeline\_eis/unev\_final\_eis.html Boarman et al. 2006. Ecology of a population of subsidized predators: Common ravens in the central Mojave Desert, California. Journal of Arid Environments 67 (2006)248-261 Bradford, D.F., J.R. Jaeger, and R.D. Jennings. 2004. Population status and distribution of a decimated amphibian, the relict leopard frog (Rana onca). The Southwestern Naturalist 49(2):218-228. Bramble, D.M. 1971. Functional Morphology, Evolution, and Paleontology of Gopher Tortoises. PhD Dissertation. U.C. Berkeley. Buckland, S.T., Anderson, D.R., Burnham, K.P., Laake, J.L., Borchers, D.L. and Thomas, L. 2001. Introduction to distance sampling. Oxford University Press, Oxford, UK. Center for Biological Diversity (CBD). 1998. Species assessment for yellow-billed cuckoo. Website accessed on December 12, 2010. Available at: http://biologicaldiversity.org/ 55 | P a g e

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This revised text maintains clarity by explicitly identifying noun phrases instead of pronouns, facilitating better understanding of the references within the document, particularly for those related to the U.S. Fish and Wildlife Service and the species referenced.Sure, here is the revised text with coreference resolution applied:

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"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 Proposed Project. The goal of the Bird and Bat Conservation Strategy, and any BBCS, is to reduce, and ultimately eliminate 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 Endangered Species Act (ESA) (USFWS 2010a).

1.1 Purpose This Bird and Bat Conservation Strategy (BBCS) has been prepared in compliance with state and federal regulations to outline project-specific practices and measures for reducing avian and bat impacts potentially resulting from operation of the Moapa Solar Energy Center (MSEC or the "Proposed Project").

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If you have more text you would like processed in this manner, feel free to share it.Two of the greatest concerns with respect to the Project are the potential for avian and, to a lesser degree, bat collision with power lines, as well as the permanent loss of golden eagle (Aquila chrysaetos) foraging habitat. This plan presents a mitigation and monitoring scheme, which would allow the MSEC to evaluate potential causes of take and implement appropriate minimization and avoidance measures.

1.2 Goals

Implementation of this Bird and Bat Conservation Strategy (BBCS) would fulfill multiple goals in an effort to reduce avian and bat mortality throughout the life of the Project. The goals specific to the 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 electric 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 transmission lines and 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;

5. Assist the Applicant in compliance with state and federal laws regarding avian and bat species to avoid the threat of penalties and fines;

6. Reduce the Project's effect on avian and bat species through adaptive management or other actions.

1|Page

2 Laws, Regulations, and Cultural Traditions

Native birds and bats in Nevada are protected primarily under three pieces of legislation: the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and Bald and Golden Eagle Protection Act (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).

2.1 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (16 US Code [USC] 703-712) is administered by the U.S. Fish and Wildlife Service (USFWS 1998) 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 USC 703). The list of species protected by the Act was revised in March 2010 and includes almost all bird species (1,007 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 to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. "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 1998). 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." Disturb is defined in the Act 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 the eagle's 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." Important eagle-use areas include eagle nests, foraging areas, or roost sites that eagles rely on for breeding, sheltering, or feeding, and the landscape features surrounding such nests, foraging areas, or roost sites that are essential for the continued viability of the site for breeding, feeding, or sheltering eagles.2|Page

587 3 Proposed Project

3.1 Project Area and Description

The Proposed Project would be located approximately 20 miles northeast of Las Vegas in Clark County, Nevada (Figure 1) on 850 leased acres within the Moapa Paiute Indian Reservation. The Moapa Paiute Indian Reservation in Clark County, Nevada, consists of 71,954 acres of land located approximately 25 miles northeast of Las Vegas. Clark County extends over 8,091 square miles. The 850-acre solar power generating facility (SPGF) would be located wholly on lands within the Moapa Paiute Indian Reservation. The Gen-Tie lines and access road would be located on Bureau of Land Management (BLM) administered lands south of the solar power generating facility site. A water pipeline associated with the Proposed Project would be located on Moapa Paiute Indian Reservation lands north and east of the solar power generating facility. Figure 2 shows the location of the Proposed Project and associated facilities. The Proposed Project would be developed using photovoltaic (PV) technology to generate up to 200 Megawatts (MWs) of energy. The Proposed Project is 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 Proposed Project site is situated in the north end of the Dry Lake Valley. The solar power generating facility consists primarily of low-profile bajada slopes and ephemeral washes, which drain to Dry Lake, a closed basin playa. Elevations across the Proposed Project Area range from approximately 1,960 to 2,080 feet. The general ecological setting of the Proposed Project is consistent with Mojave Desert scrub. The area is dominated by open stands of creosote bush (Larrea tridentata) and white bursage (Ambrosia dumosa). Desert saltbush (Atriplex spp) scrub habitat and cactus-yucca scrub are also present and concentrated within ephemeral washes. A more detailed description of the project area can be found in the Draft Environmental Impact Statement for the Moapa Solar Energy Center. The Proposed Project facilities would disturb approximately 896 acres of the Moapa Paiute Indian Reservation and 64 acres of Bureau of Land Management land. The solar arrays, heliostats, substation, operations building and parking would be contained within an 850-acre solar power generating facility footprint; the 500kV transmission line corridor would impact approximately 14.7 acres and have a length of approximately 1.6 miles; the water pipeline would impact approximately 32.5 acres and have a length of approximately 5.4 miles; the 230kV transmission line would impact approximately 45.0 acres of land and have a length of approximately 7.1 miles. A 2.5-mile access road would impact approximately 18.1 acres of land. The Proposed Project location allows efficient connection of the energy from solar resources to existing transmission infrastructure. The selected site is adjacent to an existing transmission corridor that has a direct path to the Harry Allen Substation and to the Crystal Substation.

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3.2 Project Components

The Proposed Project would include the following main elements: percent PV solar modules, percent single tracking systems mounted on embedded pier ballast or foundations, percent power inverters, percent on-site substation, an approximately 7.1-mile interconnection to the Harry Allen substation via an up to 230kV transmission line, an approximately 1.6-mile interconnection to the Crystal substation via an up to 500kV transmission line, modifications to the Crystal substation, a water pipeline extending approximately 5.4 miles, an Operation and Management (O&M) area to accommodate the O&M building, parking area, temporary laydown area, evaporation/retention ponds, and other construction-associated facilities, an approximately 2.5-mile access road, drainage controls to facilitate and/or slow drainage to existing ephemeral washes, stormwater controls within drainage features to slow flash flood flow to nearby railroad culverts, and approximately 5 miles of perimeter fence.

3.2.1 Substation, Transmission Line and Interconnections

The Proposed Project includes the construction of an on-site substation (within the 850-acre solar facility) with medium voltage (12.5-kV or 34.5-kV) to high voltage (230-kV/500-kV) step-up transformer(s) with mineral oil, breakers, buswork, protective relaying, supervisory control and data acquisition (SCADA), and associated substation equipment.

3.2.1.1 500-kV Gen-Tie Transmission Line

The 500-kV Gen-Tie transmission line would exit the solar facility at the southwest corner and travel east for 1.2 miles along the southern boundary of the Moapa Paiute Indian Reservation before turning 90-degrees to the south and traveling 0.4 miles before entering the northern boundary of the Crystal Substation 500-kV yard.The 500-kV line would impact 12.4 acres of Tribal land and 2.3 acres of BLM land (Figure 2). 3.2.1.2 230-kV Gen-Tie Transmission Line The 230-kV Gen-Tie transmission line to Harry Allen would head south from the SPGF site for approximately 2.5 miles until meeting an existing 500-kV transmission line. The proposed transmission line would then follow, on the north side, the existing transmission line for approximately 3.8 miles and then stay north of the Harry Allen 500-kV Substation. Approximately 6|Page 591 Proposed Project MSEC Bird and Bat Conservation Strategy 0.3 mile past the substation, the proposed transmission line would cross an existing 500-kV transmission line at a 90-degree angle and proceed for another 0.4 mile before turning northeast and connecting into the Harry Allen 230-kV Substation on the north side of the substation. This route is approximately 7.1 miles long (Figure 2). 3.2.1.3 Transmission Line Poles The Project is considering steel monopole transmission structures for the 230-kV line to the Harry Allen Substation (Figure 3). The steel monopole transmission structures for the 230-kV line would range in height from 60 feet to 100 feet. The steel monopoles for the 500-kV line to the Crystal Substation would also be steel monopoles. 7|Page 592 Moapa Solar Energy Center EIS FIGURE 3 TYPICAL 230 kV MONOPOLE STRUCTURE Date: 03-31-13 Author: djb I:\Moapa Solar/MXD's/Typical 230kV Monopole 8.5x11 033013\_Figure 3.mxd 593 Proposed Project MSEC Bird and Bat Conservation Strategy 3.2.2 Solar Field The solar field would utilize PV technology and would cover approximately 850 acres on the Reservation. The PV modules, inverters, and transformers would be grouped into approximately 1 to 2 megawatts of alternating current (MWac) blocks. 3.2.3 Water Pipeline Water for the Project would be provided to the Project by the Tribe from an existing well located northeast of the SPGF site (Figure 2). A water pipeline would travel from the southeast corner of the Proposed Project site for approximately 5.4 miles and connect with the existing Reservation well. Water uses for a PV project include needs for panel cleaning, service water, potable water, and fire protection water. The expected water use for the Project is approximately 30 acre-feet/year (acf/y) at average ambient operating conditions. 3.2.4 Evaporation Pond Evaporation ponds covering approximately 5 acres are planned to allow plant operations to continue in the event that an evaporation pond needs to be taken out of service. 3.2.5 Artificial Lighting The Project's lighting system will provide operation and maintenance personnel with illumination for both normal and emergency conditions near the main entrance and the Project substation. The Project's lighting system will be designed to provide the minimum illumination needed to achieve safety and security objectives and will be downward facing and shielded to focus illumination on the desired areas only. There will be no lighting in the solar field. Therefore, light trespass on surrounding properties will be minimal. If lighting at individual solar panels or other equipment is needed for night maintenance, portable lighting will be used. 3.2.6 Access Road The Project would require vehicular access for construction, operation, and maintenance. A 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15 would be constructed on BLM-administered lands. From the existing paved frontage road west of I-15, the proposed site access road would follow an existing dirt road for approximately 2.0 miles until the proposed site access road reaches the proposed 230-kV Gen-Tie transmission line ROW which the proposed site access road would follow approximately 0.5 mile north to the SPGF site (Figure 2). 9|Page 594 4 Species of Concern The Proposed Project site supports suitable nesting and/or foraging habitat for several avian species and potentially suitable foraging habitat for several species of bat. The following section describes the known and predicted occurrences of avian and bat resources in and around the Proposed Project site. 4.1 Bat Species No bats are currently listed by the USFWS or the Nevada Natural Heritage Program as threatened or endangered in Clark County, Nevada (USFWS 2013; Nevada Natural Heritage 2010). Twelve species of bat could occur within the Proposed Project site, and the BLM has designated all twelve as sensitive species.If present at all, these species are only expected to be present within the Proposed Project site during nocturnal foraging events and are addressed in Table 1. There are no known or expected roosting locations or hibernacula within or in the immediate vicinity of the Proposed Project site.

Scientific Name | Common Name | Status | Habitat | Potential to Occur

Macrotus californicus | California leaf-nosed bat | N, NP | Inhabits low deserts, caves, mines, buildings. | Low potential to occur. California leaf-nosed bat occurs at lower elevations.

Myotis californicus | California myotis | N | Semiarid deserts and grasslands, forests, coastal forests and montane forests. | Moderate potential to occur. California myotis is common. California myotis may forage within the Project Area.

Corynorhinus townsendii | Townsend's big-eared bat | N, NP | Salt desert scrub, sagebrush and pinyon-juniper mahogany. Townsend's big-eared bat will not live in extreme desert environments. | Low potential to occur. Townsend's big-eared bat is a mine and cave obligate. Foraging habitat is not present within the project area.

Lasiurus blossevillii | Western red bat | N, NP | Woodland habitats, Muddy River area. | Low potential to occur. No suitable habitat for Western red bat.

Nyctinomops macrotis | Big free-tailed bat | N | Inhabits rocky terrain, roosts in rocky cliffs, weather rock fissures including desert shrubs. | Low potential to occur. Big free-tailed bat is rare.

Myotis thysanodes | Fringed myotis | N, NP | Low desert scrub to high elevation coniferous forests. | Low potential to occur. Fringed myotis relies on cave roosts.

Myotis velifer | Cave myotis | N | Cave dwelling; will roost in rock or wall crevices, old buildings, and under bridges. | Low potential to occur. Cave myotis is rare.

Antrozous pallidus | Pallid bat | N, NP | Arid deserts and grasslands. Shallow caves and crevices, rock outcrops, buildings, and tree cavities. | Low potential to occur. Pallid bat relies on tree roosts.

Euderma maculatum | Spotted bat | N, NP | Desert scrub to forest habitats. Roosts in caves and crevices. | Low potential to occur, Spotted bat prefers riparian areas for foraging.

Idionycteris phyllotis | Allen's lappet-eared bat | N, NP | Uses a variety of habitats including Mojave desert scrub, coniferous forests, and riparian woodlands. | Low potential to occur. Allen's lappet-eared bat prefers high coniferous forest.

Pipistrellus hesperus | Western pipistrelle | N | Desert habitats of blackbrush, creosote bush, salt desert shrub, and sagebrush. | Moderate potential to occur. Western pipistrelle is common.

Tadarida brasiliensis | Brazilian free-tailed bat | N, NP | Roosts in caves, man-made structures. Found from low desert to high mountains. | Moderate potential to occur. Brazilian free-tailed bat is an abundant species in southern Nevada.

N BLM Nevada Special Status Species - designated Sensitive by State Office

NP Nevada State Protected Species protected under NRS 501.

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 CFR parts 13 and 22, as well as the MBTA. Periodic helicopter surveys by NDOW indicate that suitable nesting and remnant nests occur approximately 4.4 to 6.6 miles north and west of the Proposed Project. The entire Proposed Project site is considered suitable foraging habitat for golden eagles and golden eagles are 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 4.4 miles from the project area. The construction and O&M of the Project are not expected to result in take. However, the potential for collision would be increased by the construction of this project if proper precautions are not taken.

4.3 Special Status Avian Species

In addition to the BGEPA and MBTA, the BLM and the State of Nevada have 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.

Scientific Name | Common Name | Status | Habitat | Potential to Occur

Aquila | Golden eagle | NP, N, BGEP | Mountainous and open terrain. | Moderate likelihood to occur.Generally nests occur in rocky outcrops. See an in-depth discussion on the golden eagle (Aquila chrysaetos) below. Yellow-billed cuckoo (Coccyzus americanus) is found in open woodland, parks, and deciduous riparian woodland; there is a low likelihood of yellow-billed cuckoo to occur in the area, as there is no suitable habitat present. The western burrowing owl (Athene cunicularia hypugaea) can be found in open grasslands, desert scrub, agricultural lands, and open stages of pinyon-juniper habitat. There is a moderate likelihood for the western burrowing owl to occur, as the western burrowing owl may forage or nest in the Project Area, although none were detected during biological surveys. The ferruginous hawk (Buteo regalis) inhabits open grasslands, sagebrush flats, low foothills, and fingers of pinyon-juniper habitat. There is a low likelihood for the ferruginous hawk to occur due to limited suitable habitat present. The Swainson's hawk (Buteo swainsoni) lives in agricultural valleys with cotton, elm, or other suitable nest trees. There is a low likelihood for the Swainson's hawk to occur as no suitable habitat is present. The western snowy plover (Charadrius alexandrinu s nivosus) is found on beaches, dry mud or salt flats, and sandy shores of rivers, lakes, and ponds. There is a low likelihood for the western snowy plover to occur as no suitable habitat is present. The southwestern willow flycatcher (Empidonax traillii extimus) inhabits thickets, scrubby and brushy areas, open second growth, swamps, and open woodland. There is a low likelihood for the southwestern willow flycatcher to occur due to unsuitable habitat present. The peregrine falcon (Falco peregrinus) is found in mountains, open forested regions, and human population centers, although there is little suitable foraging habitat present and no suitable nesting habitat for the peregrine falcon.

Gymnorhina is found in pinyon-juniper woodland and less frequently in pine; Gymnorhina also occurs in scrub oak and sagebrush. There is a low likelihood for the pinyon jay (Gymnorhina cyanocephalus) to occur because there is no suitable habitat present. The loggerhead shrike (Lanius ludovicanus) inhabits open country with scattered trees and shrubs, savanna, and desert scrub. There is a moderate likelihood for the loggerhead shrike to occur, as the loggerhead shrike may forage within the Project Area. Lewis' woodpecker (Melanerpes lewis) is found in open forest and woodland, often logged or burned, including oak and coniferous forest. There is a low likelihood for Lewis' woodpecker to occur as no suitable habitat is present. The Yuma clapper rail (Rallus longirostris yumanensis) inhabits freshwater marshes containing dense stands of cattails and bulrushes. There is a low likelihood for the Yuma clapper rail to occur, as no suitable habitat is present. LeConte's thrasher (Toxostoma lecontei) inhabits sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills. There is a moderate likelihood for LeConte's thrasher to occur since suitable habitat is present. Brewer's sparrow (Spizella breweri) is strongly associated with sagebrush in areas with scattered shrubs and short grass. There is a low likelihood for Brewer's sparrow to occur, as little suitable habitat is present. The bald eagle (Haliaeetus leucocephalus) requires large bodies of water for feeding and mature trees for roosting. There is a low likelihood for the bald eagle to occur since no suitable habitat is present. Bendire's thrasher (Toxostoma bendirei) occupies a variety of desert habitats with fairly large shrubs or cacti and open ground, or open woodland with scattered shrubs and trees. Bendire's thrasher is rare.

This section outlines potential risks to bird and bats resulting from the Proposed Project. Section 6 provides methods to avoid or minimize these risks through Project design, construction, and operation measures. Section 7 addresses how the Applicant will monitor and prevent avian and bat species mortality, and Section 8 outlines Adaptive Management and supplemental measures for consideration. Based on the results of the wildlife surveys completed for the Project, potential Project-related risks associated with the construction and operation would include collisions with overhead electric lines, solar panels, and other features, electrocution, loss of foraging habitat and habitat fragmentation, nest and roost site disturbance, and disturbance due to ongoing human presence at the facility. As an approach to continue to assess risk during construction and operation stages, the Applicant will conduct reviews quarterly for the first year following construction to track, develop, and manage issues.

Vulnerability to collision depends on many factors, including bird behavior and maneuverability, topography, weather, and power line design and placement.Bird collision with power lines has been documented for decades, and the 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). Birds may have significant "blind spots," increasing the risk of collision even during daylight hours. Birds scanning below for prey or roost sites can render birds blind to objects in the direction of travel (Martin and Shaw 2010). Transmission lines are the Project components that present the greatest risk of avian collision. Given that the utility corridor is currently populated with seven electric transmission lines ranging in size from 230-kV to 500-kV, it is assumed that the addition of two proposed lines on the east side of the existing utility corridor would not have a cumulative effect on in-air collisions. The existing lines have been in place for many years, and foraging flight patterns have most likely adapted to the vast size of the utility infrastructure. There is no scientific evidence of fatality risks to birds associated with solar PV arrays. However, PV panels are obstacles to avian species that forage at low altitudes (<15 ft) or rely on ground-based bird transit and therefore present some small risk of collision for those species. The PV panels present little to no risk to the majority of avian species that migrate through the area or raptor species that forage at high altitudes.

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 the Gen-Tie Line and collector lines on the SPGF will minimize electrocution risk. The Gen-Tie Line and 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 highly unlikely.

The Tribe, Bureau of Indian Affairs (BIA), or the BLM do not have regulations quantitatively limiting noise generation or effects from the Project 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. The Project would affect ambient noise and vibration levels if the Project 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. 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 above, potentially resulting in alteration of foraging and/or nesting behaviors. There is a potential for nest disturbance of migratory birds as well as disturbance of burrowing owl burrows during the construction phase of the project due to noise, removal of vegetation, and leveling the ground. Known golden eagle nesting areas are located 4 to 6 miles from the Project. It is not expected that noise and other construction activity would affect nesting behavior at this distance. Short-term impacts could result to birds; however, the area within the fenced solar facility would be void of sensitive or listed species. Impacts to vegetation and presence of humans and machinery would deter most birds from within the solar facility and therefore noise impacts to wildlife would be focused upon species immediately adjacent to the facility. Given the location of the facility, it is assumed that 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. Habitat Loss and Fragmentation An estimated 889 acres considered suitable foraging habitat for Golden Eagles and other avian/bat species discussed in this Bird and Bat Conservation Strategy (BBCS) would be permanently affected by the Project, with additional temporary losses of an estimated 71.3 acres foraging habitat during construction activities. Loss of foraging habitat could impact foraging behaviors of Golden Eagles, other avian species, and bat species. The Proposed Project permanent impact of 960 acres of suitable foraging habitat for Golden Eagles, other avian species, and bat species is very small (0.04% assuming 10-mile foraging area) in comparison to available habitat within Dry Lake Valley. The Project Area currently supports suitable nesting and foraging habitat for some avian species, and foraging habitat for some bats. Some avian species and bats 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 Project, the avian nesting season for most bird species is from late February to early July. The human activity at the Spring Valley Wind Farm (SPGF) site or along the Generator Tie Line (Gen-Tie Line) 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 Project's 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 bat roosts or nursery colonies 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 Proposed Project site but the Proposed Project site potentially provides bat foraging habitat. Because bats do not forage during daylight hours the potential for Project-related construction or operations impacts on bats is limited but some nighttime construction could occur. Direct habitat loss will occur from the Project, 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 the 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.

Areas of Risk MSEC Bird and Bat Conservation Strategy Artificial Lighting Additional light sources during the operation of the Mountain States Energy Corporation (MSEC) 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 focusing light sources downward. If lighting at individual solar panels or other equipment is needed for night maintenance, portable lighting will be used. Evaporation Pond Evaporation ponds covering approximately 5 acres are planned to allow plant operations. The ponds could accumulate organic chemicals that could potentially harm birds or bats if the ponds are used as a water source. Netting could be used to deter avian and bat species from foraging in and around the evaporation ponds, though the netting itself presents a risk for entanglement by birds or bats. 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. Operations and Maintenance (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 Operations and Maintenance 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.\*\*Mitigation Measures\*\*

As discussed in Section 4, the Proposed Project Area supports suitable habitat avian species, thereby creating a potential for impacts on avian species from construction and O&M activities. The potential for impacts to bats is low because bats 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.

\*\*Collision\*\*

Areas along the Gen-Tie transmission options where a high degree of mortalities are observed during post-construction mortality monitoring (Section 7.4), if any, would incorporate bird flight diverters on the static line to make the static line more visible. Static lines are the smallest diameter lines, and potentially the most difficult for birds to see and avoid. Flight diverters offer a strong deterrent to avian species at relatively low cost. Where any pole requiring guy wires is located near areas of concentrated bird activity, guy wires would be marked to increase visibility where possible. Currently, guy wires are not anticipated. Post construction monitoring and adaptive management (Section 8) will clarify areas of concentrated avian and/or bat use as well as areas experiencing a high degree of avian or bat mortality. Additional flight diverters will be installed through adaptive management measures if collision is verified as a cause of mortality. Flight diverter types and locations would be determined through consultation with the BLM, USFWS, and/or NDOW. The number of structures needing the use of guy wires would be kept to a minimum.

\*\*Electrocution\*\*

All transmission towers and 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, transformers and power lines would be constructed utilizing avian-safe practices as suggested by APLIC using industry standards (APLIC 2006). Any potential electrocution caused mortality to avian or bat species would be captured under the reporting system (Appendix A).

\*\*Anti-Perching and Nesting\*\*

To reduce perching along segments of the transmission line, 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. Anti-perching and nesting devices 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 which use surrounding vegetation for foraging and nesting. Exact locations of perch deterrents would be determined in consultation with USFWS and NDOW prior to construction of the line. Inspections of lines and other areas where raptor or corvids (crows and ravens) might nest along the transmission lines would be conducted annually. Inactive nests 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 permissions via USFWS would be obtained. Reporting of nests and nest relocation would be completed using forms found in Appendix B.

\*\*Habitat Loss and Fragmentation\*\*

Construction of the linear water pipeline and electric transmission lines would have a temporary effect on vegetation, but the areas would be allowed to re-vegetate or would be actively restored and wildlife species would be able to utilize the areas for habitat and foraging. Use of the existing utility corridor for access and transmission largely restricts the impact to a previously impacted area, and aids in reduction of impacts to historically undisturbed areas within the Reservation and on BLM-managed lands. A Weed Management Plan (WMP) has been prepared and will be submitted to the BIA, BLM and the Tribe for review and approval before construction begins. Methods of noxious weed and invasive species identification, prevention and treatment for the Project are outlined in the WMP. The WMP recognizes the Project's 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 850-acre SPGF footprint.

\*\*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.

If vegetation clearing is proposed to begin during the breeding season, a qualified biologist would conduct pre-construction nest surveys within 14 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. Environmental monitors would be in place during the entire construction period to minimize impacts to natural resources. During clearing activities associated with construction, qualified biologists would relocate 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 or relocation of nests are regulated by the USFWS under the MBTA. 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. 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 the nests are on BLM lands. The biological monitor would halt work if the biological monitor determines that active nests are being disturbed by construction activities and the appropriate agencies would be consulted. Golden eagle nests located within one mile of any construction activities would be monitored by a qualified biologist. If an active golden eagle nest is located within one mile of a construction area, a one-mile avoidance buffer zone would be established. Construction may commence once a qualified biologist has determined the young golden eagles have fledged or the nest is no longer active. Disturbance buffers for other raptors would follow the USFWS Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances (1999) to determine appropriate survey areas and disturbance buffers for active nests. A qualified biologist would conduct pre-construction surveys within 30 days prior to construction for western burrowing owl within suitable habitat prior to breeding season. All areas within 250 feet of the Project 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 authorized 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).

Multiple evaporation ponds covering approximately 50 acres are planned to allow plant operations to continue in the event that an evaporation pond needs to be taken out of service. The evaporation ponds could accumulate organic chemicals that could potentially harm birds or bats if the ponds were used as a water source. To eliminate avian and bat use of the evaporation pond at the project site, the evaporation pond would be covered with bird proof netting. The netting itself poses a small risk of entanglement. The netting used would be a fine black twine mesh (as opposed to monofilament). The netting would be suspended more than 5 feet above the water surface upon installation so that the bird proof netting will not dip into the water should sagging develop later on. During the biological monitoring of SPGF (addressed in Section 7) the Applicant would also include an assessment of the netting, ensuring that no birds or bats are entangled and no holes have developed that would increase the risk of indigestion of dissolved solids or entanglement in the bird proof netting. If the bird proof netting were deemed to be an entanglement hazard, the biological monitors would then use Adaptive Management strategies outlined in Section 8 to reduce the hazard. After the designated biological monitoring ceased at the Proposed Project site, O&M staff at the SPGF would regularly check and maintain the bird proof netting to ensure no holes would develop.6.8 Litter 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 garbage will be removed promptly when full to avoid creating attractive nuisances for birds and bats. Open containers that may collect rainwater will also be removed or stored in a secure or covered location to not attract birds.

7 Monitoring Post-construction monitoring would occur for three years after completion in order to determine whether the mitigation measures being used are effective or if the mitigation measures need to be adapted to better fit the needs of the Project. Monitoring periods could be extended if proper progress is not being made in reduction or elimination of avian and bat related incidents.

7.1 Avian Monitoring Pre-construction nest surveys would be conducted by qualified biologists prior to but within 14 days of construction. Active nests would be recorded and a buffer area would be placed around the nest location. Removal or relocation of the nest would only occur after the young have fledged. Biological monitors would be assigned to the Project in areas of sensitive biological resources. The biological 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, biological monitors would flag the boundaries of areas where activities would need to be restricted to protect the species of concern discussed in this Bird and Bat Conservation Strategy (BBCS) as well as other plant and animal species not listed. Those restricted areas would be monitored to ensure those restricted areas' protection during construction.

7.2 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 Proponents may seek to obtain the federal and state permits by working with the federal and state resource agencies to determine which federal and state permits are necessary. Under no circumstances would the Proponents perform any activity requiring a permit without first obtaining the proper permit or authorization to do so.

7.3 Training A Worker Environmental Awareness Program (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 Project. 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 the sensitive biological resources' legal status and protections, and measures to be implemented for avoidance of these sensitive resources. A record of all trained personnel would be maintained.

7.4 Avian and Bat Mortality Surveys The Applicant will monitor the Solar Power Generating Facility (SPGF) and Gen-Tie Lines to document and report avian mortalities, which can help identify areas of concern by tracking both the specific locations where mortalities occur, as well as the quantity of such mortalities. Any dead or injured birds or bats observed by personnel conducting Operations and Maintenance (O&M) activities within the SPGF and along the Gen- 22 | Monitoring MSEC Bird and Bat Conservation Strategy Tie Lines will be reported in accordance with the existing USFWS Bird Fatality/Injury Reporting Program (https://birdreport.fws.gov/). Bat mortalities will also be reported to USFWS, Bureau of Land Management (BLM), and the Tribe. Data forms for recording bird and/or bat mortalities can be found in Appendix A. All bird collisions and electrocutions discovered by construction and operations staff will be recorded using a two-page reporting form that identifies date, time, and location of the incident. Carcasses will be photographed from at least two angles. All raptor mortalities will be reported to BLM/Bureau of Indian Affairs (BIA) and/or USFWS within 24 hours of discovery or notification of a carcass. Additionally, the Applicant or the Applicant's representatives will perform post-construction avian and bat mortality monitoring during at least the first three years of operation of the Project to demonstrate that the level of incidental injury and/or mortality does not result in an unanticipated long-term decline of any avian populations in the region. The monitoring report will be updated seasonally (every 3 months) for the first year of monitoring, then annually for years 2 and 3. Copies of the monitoring report will be sent to the USFWS and the wildlife agencies at the addresses provided below.USFWS: Regional Migratory Bird Biologist US Fish & Wildlife Service, Southern Nevada Field Office 4701 North Torrey Pines Drive Las Vegas, Nevada 89130 Section 7 Biologist Southern Nevada Field Office 4701 North Torrey Pines Drive Las Vegas, Nevada 89130 Biomonitor Southern Nevada Field Office 4701 North Torrey Pines Drive Las Vegas, Nevada 89130 NDOW: Wildlife Biologist 4747 Vegas Dr. Las Vegas, NV 89108 BLM: Wildlife Biologist BLM Southern Nevada District Office 4701 North Torrey Pines Las Vegas Nevada 89130 23 | P a g e

"Monitoring MSEC Bird and Bat Conservation Strategy BIA Environmental Protection Specialist Western Regional Office 400 North 5th Street, 12th Floor Phoenix, Arizona 85004 Monitoring will be completed by qualified observers. The monitoring program for the Proposed Project is based on the USFWS guidance entitled Monitoring Migratory Bird Take at Solar Power Facilities: An Experimental Approach (USFWS 2011) with modifications (there is no double-observer, there is no increase in sampling proportion for low-mortality results). Transect Sampling: For each kilometer of Gen-Tie Line, 300-meter transects will be randomly established along the Gen-Tie Line, allowing for approximately 30 percent of the Gen-Tie Line to be sampled. The transects will be positioned along the centerline of the Gen-Tie Line. The transects will also be positioned to result in approximately 30-percent coverage of the SPGF. Transect selection will be either randomized or systematic randomized. The entire perimeter of the solar facility will also be surveyed during each survey period in addition to the interior transects. Though netting will be in place, the immediate edges of the evaporation pond would be walked to monitor floating carcasses or carcasses which have been washed to shore to determine the effectiveness of the nest. If multiple ponds occur, efforts would be made to sample each pond. The transects will be surveyed for 7 consecutive days each month. Each transect will be surveyed once daily. One qualified observer will walk along the pre-determined transects searching for bird/bat carcasses. When a carcass is observed, a GPS location will be recorded at the carcass (for DISTANCE analysis), the species will be identified and information regarding carcass condition will be collected, as per USFWS (2012) utilizing an electronic data dictionary or paper datasheets. Each carcass will be marked uniquely and inconspicuously with tape and permanent marker to assess "recapture" rates. All carcasses will be left exactly as found and USFWS will be notified of all mortalities within 24-hours. Once data are collected at a carcass, the observer will return to the pre-determined transect and continue with the survey. All sampling periods will be 7 consecutive days, and the observers will continue to record presence, location (using universal transverse Mercator [UTM]), and condition of all observed carcasses. Shapefiles of the transects, fatalities, and solar development Project features will be provided to USFWS, along with electronic data or copies of completed paper data sheets. Scavenger removal trials will be performed following the methods outlined in USFWS (2012b). The scavenger removal trials will use carcasses of wild birds of several size classes mimicking the suite of species present in the vicinity of the project area. Carcasses will be checked daily until the carcass is removed (defined as less than 5 feathers remaining at the carcass location). Scavenger removal trials will be conducted at least twice annually; once during the hot season 24 | P a g e"

Monitoring MSEC Bird and Bat Conservation Strategy and once during the cool season. Scavenger removal rates will be estimated following Warren- Hicks et al. (2012). Searcher proficiency trials will be conducted following the methods outlined in USFWS (2012b). The searcher proficiency trials will be conducted unbeknownst to the observers being tested. Carcasses will be randomly placed along transects and discreetly marked in order to not alert the searcher that a trial is being conducted. All searchers participating in mortality monitoring will be tested. Analysis and Reporting: Two primary analyses will be conducted. The first will use Program DISTANCE to determine the most effective transect width to search for carcasses. The second will use Program MARK to estimate total number of mortalities controlling for detection rate, scavenging rate, and proximity to Project components. The following additional steps will be taken: Necropsies will only be completed in cases where mortalities are suspected to be unrelated to project infrastructure. Mortality monitoring may additionally be conducted on nearby lands that are not included in the project in order to establish an estimate of the background mortality rate in the vicinity of the project.Certainly! Below is the revised text with coreference resolution applied:

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Searcher bias and scavenger removal rates will be calculated using carcass detection and removal trials using the Warren-Hicks estimator; results will be adjusted to account for searcher bias and scavenger removal rates. The results of the mortality analysis reports will be provided to both BLM and USFWS. If the post-construction mortality monitoring indicates that the Project is resulting in unanticipated and unacceptable impacts on any avian population (especially special status species), the Applicant will enhance study efforts and/or provide supplemental mitigation as described in Section 8, Adaptive Management. If an active nest is identified within the Gen-Tie ROW or the SPGF, the Applicant will monitor the facilities for any avian interactions, including breeding and nesting activities, and will document the monitoring results, which can help identify areas of concern by tracking the specific locations where nesting might occur. Monitoring of active nests by the Applicant will continue during the life of the Project's operation. All nesting activities will be recorded using a two-page reporting form that identifies date, time, and location of the activity (Appendix B).

If the reports submitted under this section indicate that the Project results in a level of incidental injury and mortality to nesting birds that constitutes a substantial impact on the breeding population, the Applicant will take corrective action or undertake supplemental compensatory measures to support regional conservation of migratory birds in accordance with measures presented in Section 8, Adaptive Management. The Proponent would implement a Wildlife Reporting and Response System (WRRS). The purpose of the Wildlife Reporting and Response System is to standardize the actions taken by the Proponent or subcontractors in response to any wildlife fatalities or injuries observed within the Project boundary. Any dead or injured animals found within the Project boundary by Project employees would be marked and the location of any dead or injured animals found within the Project boundary would be reported immediately to the qualified biologist on-duty, and a coincidental mortality report form would be filled out (Appendix A). The qualified biologist would proceed to the site of the discovery, would complete an incident report, and take photographs. The carcass or injured animal would not be moved or removed by any individual who does not have the appropriate permits. If an endangered or threatened species is found dead or injured on the site, the qualified biologist would immediately notify the USFWS of the discovery.

Adaptive management will ensure an ongoing open communication between the Proponent and the agencies. The parties will cooperatively evaluate the plan doing what is necessary for the plan's long-term success. The Applicant will work collaboratively with the BIA, BLM and USFWS to comply with legal requirements as well as the requirements contained within the MSEC BBCS. The MSEC BBCS is a "living" document. To facilitate evaluations of impacts on regional avian and bat populations, study results will be provided to USFWS, BIA and BLM on an annual basis. The Project Owner will be available for annual meetings with BLM, BIA and USFWS to discuss Project related issues under the jurisdiction of each agency. If the reports submitted indicate that mitigation measures and avoidance and minimization measures proposed in Section 6.0 are not sufficient in addressing Project impacts, the Project owner will consider taking additional corrective actions or implementing supplemental measures agreed upon in coordination with the various agencies.

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Please let me know if you need further adjustments!Martin, G.R. and J.M. Shaw. 2010. Bird collisions with power lines: Failing to see the way ahead? Biological Conservation 143 (2010) 2695-2702. August 2010. Natureserve. 2013. NatureServe Web Service. Arlington, VA. U.S.A. Available http://services.natureserve.org. (Accessed: 26 March 2013) Nevada Natural Heritage Program. 2010. Department of Conservation and Natural Resources. http://heritage.nv.gov/index.htm. Accessed March 30, 2013. Reed, J.R., Sincock J.L., Hailman J.P. 1985. Light attraction in endangered procellariiform birds: reduction by shielding upward radiation, The Auk, 102, 377-383. U.S. Fish and Wildlife Service (USFWS). 1998. The Migratory Bird Treaty Act (16 United States Code 703-712). Available at: http://www.fws.gov/laws/lawsdigest/migtrea.html U.S. Fish and Wildlife Service (USFWS) published the Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act. http://www.fws.gov/endangered/esa-library/pdf/esa\_section7\_handbook.pdf. USFWS Utah Field Office. 1999. USFWS Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances. http://www.fws.gov/wyominges/Pages/Species/Species\_SpeciesConcern/Raptors.html. U.S. Fish and Wildlife Service (USFWS) issued a document titled "Protecting Burrowing Owls at Construction Sites in Nevada's Mojave Desert Region" in June. Nevada Fish and Wildlife Office. Las Vegas, Nevada. U.S. Fish and Wildlife Service (USFWS) put forth a document titled "Monitoring Migratory Bird Take at Solar Power Facilities: An Experimental Approach" on May 2, 2011. 6pp. U.S. Fish and Wildlife Service (USFWS) developed the Region 8 Interim Guidelines for the Development of a Project-Specific Bird and Bat Conservation Strategy for Solar Energy Projects and Related Transmission Lines. U.S. Fish and Wildlife Service - Pacific Southwest Region updated it in December 2012. U.S. Fish and Wildlife Service (USFWS) created a Species by County Report. http://ecos.fws.gov/tess\_public/countySearch!speciesByCountyReport.action?fips=32003 Accessed 30 March 2013. Warren-Hicks, W.R. Wolpert, and J. Newman. 2012. Webinar on Improving Methods for Estimating Fatality of Birds and Bats at Wind Energy Facilities. California Wind Energy Association, September 26, 2012. Accessed at: http://calwea.org/webinar.html. 28 | P a g e"

613 Appendix A - Mortality Reporting Data Form

614 MOAPA SOLAR ENERGY PROJECT 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.

The changes were primarily to replace pronouns referring to the "U.S. Fish and Wildlife Service" with the full noun phrase. Other details, such as document titles and authors, remain unchanged.The provided text seems to be a series of forms related to observing and reporting on wildlife, specifically concerning carcasses and nests. It does not contain narrative content or pronouns that typically require coreference resolution to link back to noun phrases. Instead, it consists of structured fields for data collection, where the information is to be filled out by the observer.

Because of the nature of the content, there are no pronouns to replace with specific noun phrases as no story or description with anaphoric references is present. If you have another type of text in which coreference resolution can be applied, please feel free to share it here.Appendix P Traffic Management Plan

Traffic and Parking Management Plan Moapa Solar Energy Center Project (MSEC) Clark County, Nevada Prepared For: U.S. Bureau of Indian Affairs U.S. Bureau of Land Management Prepared By: May 2013

1. Project Information

1.1. Background Moapa Solar LLC proposes to develop and operate the Moapa Solar Energy Center project (MSEC or Project) on the Moapa Indian Reservation (Reservation). The proposed MSEC Project would consist of a solar power generation facility (SPGF), gen-tie lines that would interconnect the Moapa Solar Energy Center project to the regional electrical transmission grid, and an access road between the solar power generation facility and a frontage road along the west side of Interstate 15 (I-15). The solar power generation facility would be located entirely on lands within the Moapa River Indian Reservation, the gen-tie lines would be located on both Reservation and Bureau of Land Management (BLM)-administered lands, and the access road would be located primarily on BLM-administered lands. Moapa Solar LLC has entered into an agreement with the Moapa Band of Paiute Indians (Tribe) to lease land, up to 30 years, on the Reservation for the purposes of constructing and operating a solar energy center. The Moapa Solar Energy Center project would utilize photovoltaic (PV) technology to generate up to 200 megawatts (MW) of energy. The electricity generated from the Moapa Solar Energy Center project would be sold to a customer via a Power Purchase Agreement (PPA) or on a merchant plant basis.

1.2. Location The Proposed Project would be located approximately 20 miles northeast of Las Vegas in Clark County, Nevada (Figure 1). The solar power generation facility would be located on 850 leased acres within the Reservation in Mount Diablo Meridian. The Proposed Project site is accessible from Exit 64 on I-15. Traffic will exit I-15 and travel a short distance westbound on Highway 93 until reaching the frontage road. Traffic will then turn northbound on the frontage road and parallel I-15. The first 5.8 miles of the frontage road is maintained by the Nevada Department of Transportation (NDOT), and the remaining 2 miles of paved road stretches up to the South Crystal Valley Substation Access Road. Beyond the South Crystal Valley Substation, the roadway becomes an unpaved utility corridor.

1.3. Scope of Work and Schedule The Proposed Project is anticipated to begin construction during the first quarter of 2014 and achieve commercial operation in the first quarter of 2015. The Project would consist of four linear ancillary facilities on federal lands managed by the BLM, including a 1.6 mile overhead 500-kV transmission line to the Harry Allen Substation, a site access road, and a 5.4 mile water pipeline (Figure 2). Construction would occur concurrently at various locations along the transmission line right-of-way (ROW). It is anticipated that construction would begin in 2014, and the overall project will be constructed over a period of 24 months for the PV Project. The construction of the transmission line portion will be approximately 4 to 6 months of the total construction schedule. Initial construction activities would involve the improvement of existing public access and spur roads where necessary. Although minimal improvements are expected, some road widening and additional gravel may be required.

The K Road Moapa Solar LLC is constructing a similar solar generating facility east of the Proposed Project with construction having begun in 2012 and expected to finish in 2016. The K Road Moapa Solar LLC project is anticipated to improve the frontage road to accommodate construction traffic for the K Road Moapa Solar LLC project, and it is anticipated that these improvements will be in place prior to the start of construction for the Moapa Solar Energy Center project. The final project completion date for the K Road Moapa Solar Facility is scheduled for the end of 2016, but the road improvements were completed at the end of 2012.

1.4. Need for the Proposed Project The Proposed Project will create an economic development opportunity for the Tribe. The Proposed Project will provide a diverse and long-term economically viable revenue stream from lease income, will create new jobs and employment opportunities for Tribal members, and will develop sustainable renewable resources. The lease for the solar energy center will optimize the use of Tribal lands while providing economic benefits. Also, the Tribe would provide water that could be used for the Moapa Solar Energy Center project. The use of the Tribe's water by the Moapa Solar Energy Center project would help the Tribe better establish the Tribe's rights to this water. Another need satisfied by the Proposed Project would be to assist the federal government, Nevada, and neighboring states meet their renewable energy goals by providing clean renewable electricity generation from the Tribe's solar resources that can be efficiently connected to the regional grid. The Tribe identified the solar energy center development as meeting the Tribe's economic development goals, as the solar energy center development would provide much-needed revenue to the Tribe, afford employment opportunities, and possibly strengthen the Tribe's water rights.The Proposed Project would provide these benefits while occupying only a small portion of the Reservation (one percent). The Proposed Project also minimizes environmental impacts and needs for new infrastructure based on the location and the proximity to existing facilities.

1.5. Purpose of the Traffic and Parking Management Plan

The Traffic and Parking Management Plan (TPMP) outlines steps to minimize the impacts and delays to traffic associated with the Proposed Project. The TPMP describes the measures that may be used to address any traffic and parking impacts identified, including public outreach.

1.6. Personnel

The person with the primary responsibility for implementation of this Transportation Management Plan is: Daniel Menahem Daniel.Menahem@res-americas.com

1.7. Existing Highway Facility

The Proposed Project site is located west of I-15 between Exit 64 (Highway 93) and Exit 74 (Moapa Paiute Travel Plaza). I-15 provides access to the Proposed Project site from Las Vegas to the south and Saint George and Salt Lake City to the north. Highway 93 runs northeast concurrent with I-15 from Las Vegas and then departs at Exit 64 where Highway 93 turns north. See Table 1-1 for more detailed information on the transportation routes and annual average daily traffic volumes (AADT) in the vicinity of the Proposed Project. Table 1-1 Summary of Existing Roads in the Vicinity of the Proposed Project # of Roadway 2012 Roadway Direction lanes Type Segment AADT Description I-15 provides a connection from North of Exit 64 19,500 Las Vegas, Nevada north to Salt North- 2 each Interstate I-15 Lake City, Utah. Provides direct South direction (paved) South of Exit 64 26,500 access to the Proposed Project site via US 93. North of I-15 2,300 Through Las Vegas, US 93 runs NB Off-Ramp 3,000 Principal concurrent with I-15. North of North- 1 each NB On-Ramp 1,000 Las Vegas, US 93 is a major US 93 Arterial South direction Highway connecting Las Vegas (paved) SB Off-Ramp 850 to the Great Basin National Park and to Ely and Wells further SB On-Ramp 2,800 north. Arterial State Route (paved North of US 93 320 a North Las for 2 miles The frontage road parallels I-15 Vegas North- 1 each north of US from North Las Vegas to US 93. Boulevard South direction 93and North of US 93, the frontage road (Frontage unpaved to continues to the Proposed Road) South of US 93 1700 the project Project site as well as other site) power generating facilities. Source: NDOT TRINA - Traffic Records Information Access Data a Notes: Estimated AADT based on the NDOT 2010 traffic data for adjacent roadways

2. Traffic Impacts

2.1. Major Transportation Routes

2.1.1. Construction Phase

The roadways listed in Table 1-1 are anticipated to be impacted by the Proposed Project. The impacts to these roadways include increased wear on the road from the construction loads, increased traffic volumes during construction, and added delay during the construction peak periods. Increased volumes for the construction personnel and the material deliveries will impact traffic flows throughout the duration of the Proposed Project. The on-site construction workforce would consist of project and site management, laborers, skilled craft, and startup personnel. The number of workers expected on the site during construction of the Proposed Project would vary over the construction period and is expected to average up to approximately 300 each day, generating about 300 daily round trips. The number of workers expected on the site during construction would vary over the duration of the Proposed Project. To account for the variability during peak periods a more conservative estimate assuming no carpooling was used. Deliveries of equipment and supplies to the site would also vary over the construction period but are expected to average about 50 daily round trips. Construction equipment would typically include augers, bulldozers, various trucks, trailers, tractors, and cranes. All Proposed Project related parking will be onsite during construction, moving within the solar field as the solar field is developed. The estimated Proposed Project construction trips projected to be generated by the Proposed Project are presented in Table 1-2. Table 1-2 Project Construction Trip Generation Total Daily AM Peak Trips PM Peak Trips Vehicle Type Trips Inbound Outbound Total Inbound Outbound Total Construction 600 300 0 300 0 300 300 Worker Vehicles Trucks 100 50 0 50 0 50 50 It is anticipated that the construction workforce for the K Road Moapa Solar Facility will overlap with the construction workforce for the MSEC Proposed Project.To prevent drastic increases in traffic during the peak hours, it is assumed that the two projects will coordinate the start and end times to be offset such that the increases in volume will not multiply the impacts of each individual project. Construction will generally occur between 7 a.m. and 7 p.m. Monday through Friday. Additional hours may be necessary to make up schedule deficiencies, or to complete critical construction activities. For instance, during hot weather, pouring concrete may need to start earlier to avoid high ambient temperatures. Work shifts will be staggered in 20-minute intervals as much as practical to reduce traffic impacts along the Frontage Road and at the intersection with Highway 93. The Proposed Project will increase traffic on I-15, Highway 93, and the Frontage Road by a maximum of 700 vehicle trips daily (600 daily worker trips and 100 daily truck trips). There are 3 two-way stop-controlled intersections that will also experience increased traffic from the Proposed Project: - Highway 93 and Northbound I-15 Ramps - Highway 93 and Southbound I-15 Ramps - Highway 93 and Frontage Road. Intersection delay (in seconds per vehicle) and Level of Service (LOS) were determined for each of the study area intersections for both the A.M. and P.M. peak hours using the Synchro software program, implementing the Highway Capacity Manual (HCM) methodology. LOS is a term that describes congestion on the basis of ratings from A to F. LOS A reflects minimum delay at an intersection, and LOS F reflects long delays at an intersection. LOS C is considered desirable for peak hour operations. For this analysis, the LOS at unsignalized intersections is measured using the methodology contained in the HCM. The HCM methodology utilizes average delay per vehicle based on peak hourly traffic volumes, peak hour factors, number of lanes, type of operation (signalized or unsignalized), and other standard variables in the calculation. For side-street stop-controlled intersections, delay is typically represented in seconds for each movement from the minor street approaches and the left turns from the major street. The results of the traffic analysis indicate that all of the three intersections will operate at LOS C or better in the AM peak hour with the addition of the construction traffic. While there will be an increased delay from the existing conditions, the delay does not cause the LOS to exceed the desirable threshold. In the PM Peak Hour, the LOS for the Southbound left turns (the construction traffic) drops to a LOS D, which is acceptable but not desirable. All other movements for the background traffic operate at LOS C or better. The construction traffic will experience a delay during the PM peak hour when the workforce is at the highest number. The Synchro output results in Appendix A. 2.1.2. Operations Phase When the site becomes operational, it is anticipated that the site would generate up to an additional 26 trips per day (13 entering in the morning peak hour and 13 departing in the evening peak hour) with the PV technology and 50 trips per day (25 entering in the morning peak hour and 25 departing in the evening peak hour) with the CSP technology. Both scenarios would have very few heavy vehicles. The site is anticipated to be operational for 25 to 30 years. The existing roadways have very low traffic volumes with limited forecasted growth. Because the increases in traffic are very minor during the Operations Phase, and the Construction Phase volumes did not have significant impacts, the operational analysis was not performed. The intersections are projected to operate at acceptable levels during the Operations Phase. 2.2. Minor Access Transportation Routes 2.2.1. Construction Phase There is currently little traffic on any of the roads bordering or in the immediate vicinity of the project. The use on these roads is associated with the energy infrastructure in the area. The portion of the Frontage Road that is north of the NDOT maintenance jurisdiction is the only existing minor transportation route that may be affected by the Proposed Project. This portion of the Frontage Road will experience the same increase in daily vehicle trips (700 vehicles) during construction of the Proposed Project. The K Road Moapa Solar LLC is constructing a similar solar generating facility east of the Proposed Project with construction having begun in 2012 and expected to finish in 2016. The early stage of this construction includes improvements to the Frontage Road north of the NDOT maintenance jurisdiction beyond the Crystal Substation and potential Proposed Access Road intersection. These improvements updated the roadway to meet the Clark County standards and added truck turn outs to facilitate passing. Thus, no additional improvements to the Frontage Road are anticipated for the Proposed Project. A 2.5-mile gravel access road connecting the SPGF to the existing paved frontage road adjacent to I-15 would be constructed on BLM-administered lands.From the existing paved frontage road west of I-15, the proposed site access road would continue to follow the existing unpaved Frontage Road for approximately 2.0 miles until the proposed site access road reaches the proposed 230 kV gen-tie transmission line ROW which the proposed site access road would follow approximately 0.5 mile north to the SPGF site. The Proposed Access Road will be constructed to meet the Clark County Construction Management Division of Public Works guidelines. The proposed access would be an unpaved roadway with approximately 10 foot lanes and 5 foot shoulders. The road will have a proposed ROW of 100 feet.

2.2.2. Operations Phase

The minor roads will experience similar impacts as the major roads during the Operations Phase. The existing Frontage Road, the Proposed Access Road, and the site routes will be built to accommodate the anticipated 100 daily trips (50 entering and 50 departing) with some maintenance potentially required in the future to ensure the roadway surface conditions satisfy the needs of the site for the duration of the operations.

3. Traffic Control Scenarios

3.1. Traffic Control Scenarios

Traffic Control will be required during the construction of the Proposed Access Road, internal roads, and parking facilities. Traffic Control may include one lane roads with flaggers regulating the traffic flows one direction at a time. The delays to the traffic will only impact the construction personnel and will not last more than 15 minutes. All roadways shall accommodate two-way traffic at the end of the work hours, or the roadways shall be closed to traffic when flaggers are not present. Traffic control shall meet the requirements in the Manual of Uniform Traffic Control Devices (MUTCD). Emergency personnel will be allowed access through the construction site at all times. The Proposed Project does not anticipate improvements on the existing transportation facilities, and the majority of the vehicles on the adjacent roads would be construction traffic. Thus the only traffic control on these facilities would be signing to inform travelers of the construction activities and access routes approaching the Proposed Project Site.

4. Mitigation of Traffic Impacts - Best Management Practices

The traffic impacts identified in the previous sections may cause added delay to travelers in the Proposed Project vicinity. This section describes potential measures which could be used to reduce the delay caused by the Proposed Project. These measures are recommended in the PM peak hour as the LOS drops below the desirable condition without any mitigation.

4.1. Motorist Information and Construction Area Signs

Informing the road users is one way to help reduce the impacts from construction. Drivers will be informed about the construction and any major delays and/or detours, allowing them to modify their travel choices. Both static and variable message signs (VMS) can be used to inform users coming from each direction that there may be delays due to construction. It is recommended to add appropriate signage on both US 93 and the Frontage Road on both ends approaching the project site.

4.2. Construction Staging

To mitigate the impacts to the construction workforce during the project, the construction will be sequenced such that the site has adequate capacity for the workforce required for the next stage. The preliminary construction stages include clearing the existing vegetation for a temporary access and constructing the parking area and staging area for storing materials and equipment needed for the roadway construction. These stages will be followed by construction of the Proposed Access Road which will provide access suitable for the remaining construction activities. All construction signing shall meet the MUTCD requirements.

4.3. Carpooling

Carpooling can reduce the total number of trips entering the site, and in turn the overall delay. The construction manager can coordinate with the workforce to determine the best location and time to coordinate carpooling to the site to minimize traffic and parking requirements. Another possible option is to organize a shuttle which takes the workers from a centralized point such as the Moapa Travel Plaza to the site. Carpooling with a minimum of two people per vehicle would reduce the delay caused by the construction to a desirable LOS.

4.4. Public Information and the Media

Updates to the local communities through the radio, the internet, or the newspaper can provide information to the users who may be impacted by the Proposed Project. Radio announcements can be made on the local stations. A project website or a social media page can be set up for the project to allow individuals to subscribe to daily updates. Newspaper bulletins can provide information on the upcoming work and areas of impact to local users. Stakeholders such as K Road Moapa Solar LLC, NV Power Company, NDOT, Clark County, Moapa Valley Community Center, Great Basin Transmission LLC, LA and SL RR Co., Intermountain Power Project, Holly Energy Partners, FTV Comm C/O Level 3, Kern River Gas Transmission Company, Desert Conservation Program, City of Mesquite, and Century Link can be informed with outreach letters prior to construction.The letter will provide a description of the project and the time frame as well as outline the restrictions that may impact the stakeholders. The letter will also provide contact information for any stakeholders who may have questions.

4.5. Off-Peak Hour Activities

The construction workforce will arrive and depart during the morning and evening peak hours, respectively. To minimize the additional trips during the morning and evening peak hours, deliveries will attempt to be scheduled during the off-peak hours as feasible.

5. Adverse Effects to the Public

5.1. Adverse Effects on Specific Vehicle Types

5.1.1. Bicycles and Pedestrians

Bicycles and pedestrians are rare in the vicinity of the Proposed Project; however, occasionally a bicycle or pedestrian may be present. The existing routes will accommodate bicycles or pedestrians, and the construction workforce will have 5-foot shoulders to traverse on the Proposed Access Road.

5.1.2. Delivery and Service Vehicles

I-15 serves delivery and service vehicles traveling between Las Vegas and Salt Lake City. Delivery and service vehicles use Love's Truck Stop at Exit 64 and the Moapa Travel Plaza at Exit 74. The Proposed Project may cause increased traffic volumes at Love's Truck Stop and Moapa Travel Plaza and along US 93 approaching Love's Truck Stop, but the delays due to the increased volume will be minor on delivery and service vehicles.

5.1.3. Emergency Services

Emergency vehicles dispatched through 911 services for ambulance, sheriff, State Highway Patrol, and the local Fire Departments use the routes within the Project vicinity. The Clark County Fire Department has an agreement with the Tribe to provide fire protection and emergency medical services to the Reservation. The existing emergency services will not be interrupted by the proposed project. The Clark County Fire Department will be notified of any expected delays that the project may induce.

6. Conclusion

The construction of the Proposed Project may have impacts on the existing transportation networks by increasing the volumes during the construction and operation periods. The construction period volumes will increase delays along I-15, the ramps at Exit 64, US 93, and the Frontage Road north of US 93. The volumes will also impact the three existing intersections. Delays are within the acceptable ranges for the AM peak hour, so no mitigation is required. Mitigation is recommended for the PM peak hour as the SB left turn experiences increase delay that results in a LOS D. The Operations Phase will increase the volumes along the same routes and at the three existing intersections, but these increases are even less in magnitude than the Construction Phase. Thus, the three existing intersections all operate at acceptable levels of service, and no mitigation is required. Potential mitigation measures have been offered in Section 4. This report assumes that the concurrent project at the K Road Moapa Solar Facility will have completed the roadway improvements along the Frontage Road to meet the Clark County requirements, and those improvements will still be applicable to both projects. Thus no improvements to the existing roadways will be required.The text you provided appears to be largely technical and tabular, containing map file details, intersection analysis summaries, and other specifications without clear narrative or pronoun usage. Due to the nature of the content, which is structured mostly in grid or data format, it lacks paragraphs and contextual sentences that usually require coreference resolution (like replacing pronouns with noun phrases).

From the data, there does not appear to be any pronouns that need replacing with noun phrases. Therefore, no modifications are necessary for coreference resolution. If you have a different text or a specific part of this content that includes pronouns that require clarification, please provide that section, and I'll be happy to assist!