Mojave Desert Solar Energy Projects and Tribal Communities

A Health Impact Assessment Project

Conducted by the National Indian Justice Center

http://www.nijc.org

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Executive Summary

The United States government has prioritized the development of renewable energy sources and the reduction in energy consumption across government agencies including the military.[1] In addition to federal agency mandates concerning renewable energy development, the State of California has set forth a goal of establishing 33% renewable electricity by the year 2020.

The siting, construction, operation and maintenance of the military's renewable energy facilities will have direct health impacts upon the military communities on the bases and those near the bases.

"As the single largest consumer of energy in the U.S., the Department of Defense (DoD) has embarked on an ambitious program of expanded renewable energy generation on military bases and in the field, with a goal of producing 25% of its energy from renewable sources by 2025."[2] The U.S. military goals include reaching net-zero energy consumption by 2030.[3] With defined community boundaries, populations, and access to technology, the U.S. military will be uniquely positioned to develop new and innovative renewable energy facilities. The development of renewable energy sources on U.S. military bases has the potential to impact the health of the military base community, surrounding municipalities as well as homelands of American Indian tribes. U.S. military bases and other federal lands that are subject to the renewable energy mandates are often near or encompassing former homelands of the 566 federally recognized Indian tribes[4] in the United States. The purpose of this **Health Impact Assessment (HIA)** is to evaluate the potential health impacts of the proposed Fort Irwin photo-voltaic (PV) array facility which will be located in the Mojave Desert region of California while

Health Impact Assessment may be defined as "A multidisciplinary process within which a range of evidence about the health effects of a proposal is considered in a structured framework … based on a broad model of health, which proposes that economic, political, social, psychological, and environmental factors determine population health."

Figure 1 - Improving Health in the United States: The Role of Health Impact Assessment, Table 1-1, p. 16. (http://www.nap.edu/catalog.php?record_id=13229).

[1] Pursuant to the U.S. EPA's Greening EPA website, the federal mandates for government agencies are set forth in Executive Order (EO) 13514, the Energy Independence and Security Act of 2007 (EISA) and EO 13423. In 2009, the American Recovery and Reinvestment Act (ARRA) provided $80 billion for clean energy investments. To see the full text of the Eos and legislation, go to http://www.epa.gov/greeningepa/energy/fedreq.htm#eo13514.

[2] Renewable Energy for Military Installations: 2014 Industry Review, American Council on Renewable Energy (ACORE), p. 4.

[3] Renewable Energy for Military Installations: 2014 Industry Review, American Council on Renewable Energy (ACORE), p. 5.

[4] Federally recognized Indian tribes are those tribes that the federal government has a government-to-government relationship and that the federal government owes a fiduciary duty under federal law. This report will use the terms American Indian and Native American interchangeably or as used in reference materials. The term American Indian is a legal term used in legislation and legal opinions.

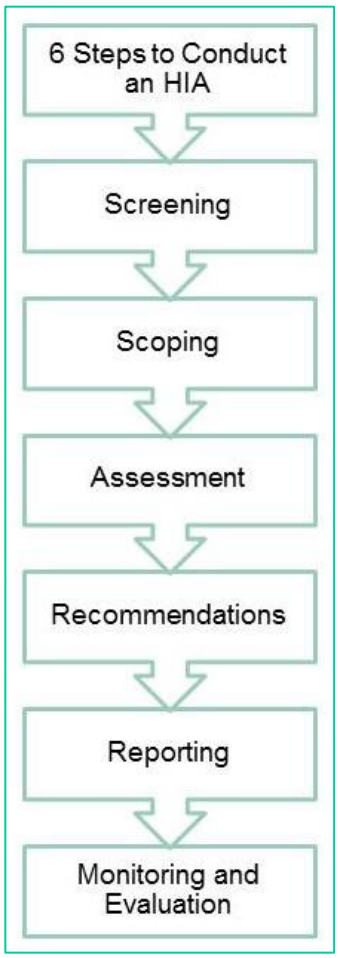
paying particular attention to the potential health impacts upon American Indian Tribes with homelands in the region.

In California, there are 110 federally recognized tribes and approximately 80 more tribal communities that are not federally recognized. There are 17 tribes that still live within or have historical ties to the Mojave Desert region. "A tribe's natural resource base is a source of cultural identity and religion, a nutritional and medicinal buffer against poverty, and a reservoir of environmental knowledge and biodiversity."[5] The major determinants of American Indian and Alaska Native health include (1) Sovereignty and Self-Determination, (2) Cultural Revitalization, and (3) Access to Culturally Competent and Affordable Health Care.[6] Any action or project that positively or negatively impacts a tribe's progress towards the health determinants has the potential to impact the health of tribal communities.

The Ft. Irwin PV array facility has the potential of impacting tribal community health with respect to the determinants of (1) sovereignty and self-determination, and (2) cultural revitalization. As a federally funded project, the Ft. Irwin PV array facility is subject to federally mandated Tribal Consultation, a process in which the tribes are contacted to discuss the potential impacts of the project. The siting and development of the military's renewable energy facilities may have potential health impacts upon tribal communities that are within the region or that have cultural affiliation with the region in which the facilities will be developed. The development of renewable energy facilities that are located some distance from the tribal lands will impact tribal cultural resources and cultural landscapes located within the region which may result in health impacts to tribal members. These health dimensions have not been adequately explored or discussed in relation to renewable energy project development in California. Tribal stakeholders in the region do not believe that the NEPA process will adequately address their concerns about the impacts upon their cultural landscapes.[7] During the research of literature, we found no military policy provisions for addressing impacts to tribal cultural and natural resources on military lands.

[5] Brief Historical Context of Indigenous Peoples and Cultural Landscapes, Harris and Harper (1999).
[6] American Indian and Alaska Health Assessment in California, California Rural Indian Health Board, Garrow, Lorenbrot, Crouch and LeBeau (2010), p. 36-37.
[7] 2011 Summit of California Tribal Museums, comments by Anthony Madrigal, Sr., Director of Policy and Cultural Resources Management, San Manuel Band of Mission Indians. In addition, comments of similar concern were made at 2012, meeting between Southern California tribes and the Bureau of Land Management to discuss issues surrounding BLM's fast tracked permitting of renewable energy projects in Southern California and the tribes' associated sacred sites and cultural resources concerns.

This Health Impact Assessment (HIA) applied the six step HIA process to analyze the health impacts of the proposed Ft. Irwin PV array facility upon the tribal communities indigenous to the Ft. Mojave region. The HIA began with an analysis of proposed renewable energy projects identified in a notice prepared by the California Energy Commission concerning 2012 Renewable Energy Action Team Generation Tracking Projects, pursuant to the California Desert Protection Act of 2012. Multiple projects were proposed in the Mojave Desert region. The National Indian Justice Center (NIJC)[8] proposed an HIA project to the Health Impact Project to look at the potential impacts of the proposed renewable energy projects. The proposed Ft. Irwin PV facility within the Mojave Desert region was selected for this HIA. The Ft. Irwin PV facility was delayed as it sought contractors and as it conducted its own environmental assessment which was not completed until September 2014.



This HIA incorporates the impacts upon tribal cultural landscapes in the health assessment of tribal communities. Moreover, the HIA may enhance the military's capacity to engage in effective tribal consultation. This HIA was conducted by the National Indian Justice Center, the HIA stakeholder group, which included representatives from Ft. Irwin Army Base, Mojave Desert tribal representatives, and State and Federal Agencies responsible for environment and land management. This project was supported by funding from the Health Impact Project and advised by Habitat Health Impact Consulting. NIJC project staff conducted outreach and established the project stakeholder group, conducted a literature review, completed both screening and scoping summaries, developed a baseline community health profile, conducted an assessment of potential health impacts and developed a monitoring and evaluation plan. These elements comprise this final HIA report. The table below summarizes the results of the Health Impact Assessment and the proposed mitigation strategies that were brought forth to Ft. Irwin.

[8] The National Indian Justice Center, Inc., is an Indian owned and operated non-profit corporation with principal offices in Santa Rosa, California. The National Indian Justice Center was established in 1983 through the collective efforts of the National American Indian Court Judges Association, the American Indian Lawyer Training Program, and the Bureau of Indian Affairs in order to establish an independent national resource for Native communities and tribal governments. The goals of NIJC are to design and deliver legal education, research, and technical assistance programs which seek to improve the quality of life for Native communities and the administration of justice in Indian country. For more information, see http://www.nijc.org.

HIA Impact Analysis Summary of Findings

Health Outcome / Determinant	Summary of Effect	Proposed Mitigation Measures
Sovereignty and Self-Determination		
Meaningful Consultation	Consultation is a federal requirement for projects that are funded with federal funds and in some cases state agencies have similar consultation requirements. . Ft. Irwin's invitation to the tribes to participate in the Ft. Irwin EA process did not include the word "consultation" which initiates a formal response from tribal partners. This resulted in lack of meaningful consultation with the tribes, as required by law. The lack of required consultation with the tribes precludes tribal contributions to the decision making process for the planning and construction of the PV facility. Denying meaningful consultation is a violation of law and it prolongs the negative policies and assumptions that sought to destroy tribal communities and culture.	Consultation should be initiated by Ft. Irwin using a letter that identifies the project as requiring consultation and inviting the tribes to participate in a face-to-face meeting. Even if the project advances, the consultation should still be conducted in an effort to engage the tribes allowing them to lend their knowledge about the cultural landscape and resources to the project.
Cultural Revitalization		
Preservation of Cultural Resources	The EA does not identify any use of tribal cultural monitors within the PV project nor as mitigation factors. Tribal Cultural Monitors are trained both in identification of tribal cultural resources but also in work zone safety. They represent an effort by tribes to preserve cultural resources and are seen as an asset in the eyes of the Tribes.	Use of cultural monitors that will identify cultural resources prior to damage or destruction would be an asset to this project.
Alteration of cultural landscape	By ignoring the cultural and spiritual links between the Mojave Desert and the tribal communities and altering the cultural landscape, the tribal community members will suffer and grieve the loss of the elements of their origin stories and songs.	The cultural landscape of the Mojave Desert and its importance to the Mojave Desert tribal communities should be acknowledged and damage should be mitigated if possible. There is no doubt among tribes that their cultural landscapes have been altered if not eliminated in some instances. Regardless of this reality, efforts at mitigating any unnecessary alteration to the cultural landscape or allowing the tribes to prepare for the change will result in a transition to loss that has not been afforded to tribes before. Mitigation efforts may include allowing tribes to administer ceremonial prayers and rites to the site which gives the tribe a chance to culturally prepare for the loss.

Impacts upon Flora and Fauna (native plants, Desert Tortoise)	The EA states that there will be approximately 250 acres of native plants that will be lost at either site if the facility is developed. The surveys of the Desert Tortoise were conducted and the findings were that there were very few tortoise found at either site. The surveys were conducted in Spring of 2012 and 2013, a time that the Desert Tortoise is less active. There are alternative habitats that include the vegetation that will be lost and that may be where the Desert Tortoise could be relocated. The timing of the survey has been questioned by the HIA Stakeholder Group and their view is that Spring was chosen to minimize the chance that tortoise would be viewed.	To mitigate this negative perception, Ft. Irwin could conduct an additional survey in the Fall. An additional mitigation would be to allow for any native plants within the sites to be relocated to tribal lands if they are not currently available on tribal lands. Alternatively, Ft. Irwin could establish a partnership with the Mojave Desert Tribes to harvest native plants that are currently not on tribal lands.
Access to and quality of subsistence foods and cultural resources	The PV construction will result in the loss of vegetation and the potential displacement of birds and other animals that migrate through and near the site. Potential contaminants in dust, water run off that impacts water and food sources for the birds and other animals could impact the availability and quality of subsistence foods and plants and animals used as cultural resources.	As identified in the EA, mitigation for this issue is to use high quality berms and skilled labor to install the berms correctly to avoid contaminated soil erosion and water run-off. Additional mitigation measures would be to employ cultural monitors that could identify any berm failures and communicate that to the tribal communities if there may be potential impacts to subsistence foods and cultural resources.
Impacts on water, air and soil quality	Tribal communities have jurisdiction over the water, air and soil quality on their tribal lands. The current tribal lands held in trust for tribal communities by the federal government are a subset of the tribe's original homelands. While they may no longer have jurisdiction over their original homelands, they still have an interest in those homelands and the cultural resources located on those lands. With respect to the PV facility's impacts on water, air and soil quality, current tribal trust lands are too distant from the proposed sites to be effected by the project's impacts on water, air and soil; however, they may have interests in any negative impacts to the cultural landscapes located at Ft. Irwin.	The only mitigation measure for potential negative impacts on water, air and soil quality would be to communicate such to the tribes in the region. Beyond informing them of the negative impacts, the tribes may be able to lend assistance in preserving or recovering damaged cultural resources.

Recommendations for Immediate Action by the U.S. Army Base at Ft. Irwin

Based upon the assessment, we make the following recommendations for immediate action to the U.S. Army Base at Fort Irwin in hopes of mitigating any negative health impacts and enhancing positive health effects of the proposed project:

1. The U.S. Army Base at Ft. Irwin should engage the Mojave Desert Tribes in meaningful consultation before construction begins.
2. The proposed Ft. Irwin PV facility should employ cultural monitors to evaluate the sites for native plants used in tribal cultural practices and to identify cultural landscapes of importance to the tribes;
3. Where alterations, damage or destruction to the cultural landscape is anticipated or identified, the Ft. Irwin PV facility construction contractor should inform the tribes within the Mojave Desert region and allow them to administer cultural practices, rites before the site is lost.
4. The Ft. Irwin EA team should consider an additional observation in an alternative seasonal time frame such as July to September when the desert tortoise is potentially more active may result in more reliable and accurate numbers of the existing desert tortoises at the site. This will in turn inform the mitigation efforts including the permitting process and expenses for removing the desert tortoises to a safer habitat; and
5. The Ft. Irwin PV facility construction contractor should develop mitigation strategies for potential infectious diseases particularly sexually transmitted infections that are associated with temporary transient workforces.
6. The U.S. Army Base at Ft. Irwin should develop a quarterly meeting schedule with tribal representatives in anticipation of consultation for future projects. It will take time to establish the level of trust required for tribes to participate in meaningful consultation.

Introduction

This Health Impact Assessment (HIA) applied a six-step HIA process to analyze the health impacts of the proposed Ft. Irwin photo-voltaic facility upon the tribal communities indigenous to the Ft. Mojave region. This report summarizes the context of the project, the results of each stage of the HIA and proposes mitigation strategies to reduce negative impacts and enhance positive impacts of the proposed development.

Project Context

The United States government has prioritized the development of renewable energy sources and the reduction in energy consumption across government agencies including the military. Pursuant to the U.S. EPA's Greening EPA site, the federal mandates for government agencies are set forth in Executive Order (EO) 13514, the Energy Independence and Security Act of 2007 (EISA) and EO 13423. In 2009, the American Recovery and Reinvestment Act (ARRA) provided $80 billion for clean energy investments. In addition to federal agency mandates concerning renewable energy development, the State of California has set forth a goal of establishing 33% renewable electricity by the year 2020.

"As the single largest consumer of energy in the U.S., the Department of Defense (DoD) has embarked on an ambitious program of expanded renewable energy generation on military bases and in the field, with a goal of producing 25% of its energy from renewable sources by 2025." The U.S. military goals include reaching net-zero energy consumption by 2030. With defined community boundaries, populations, and access to technology, the U.S. military will be uniquely positioned to develop new and innovative renewable energy facilities. As a result of these initiatives, Ft Irwin, a military site located in the Mojave Desert began plans to build a photo-voltaic array site in order to meet the renewable energy mandate of the military.

Project Description

The project activities that may influence health outcomes include the planning, construction and operation of the facility at proposed alternative site 1, proposed alternative site 2 and the no action alternative are listed below as stated in the Ft. Irwin Power Purchase Agreement (PPA) Environmental Assessment. The alternative sites 1 and 2 are similar in size and in close proximity to the Fort Irwin Front Gate, Fort Irwin Road and the Tiefort Substation. From a health perspective, the project would have the same health impacts regardless of choice of alternative site.

Proposed Action	The Proposed Action is a Power Purchase Agreement (PPA) and, as part of the PPA, the lease of land inside the Fort Irwin boundary to a private sector contractor for construction, operation, and maintenance of a PV solar array. The facility would be Government-estimated 15 megawatt electrical and would connect to existing Southern California Edison infrastructure that serves Fort Irwin via a substation adjacent to the alternative project locations. The final constructed footprint is estimated to be approximately 150 acres; however, the contractor would develop a site design that would determine the size of the solar facility. Construction parking and laydown areas could increase the project area to 250 acres, but would remain entirely within the defined site boundaries. The major project components would include: • PV modules/panels • Solar trackers (to position modules) or fixed-tilt mounting structures • Direct current (DC) to alternating current (AC) inverters • Three-phase, pad-mounted medium-voltage transformers, or similar; and high-voltage step-up transformers The PV modules, DC-to-AC inverters, and transformers would be combined into approximately 1-megawatt (MW) blocks that would be repeated to reach the full capacity. Each block would be approximately 500 feet (ft) by 700 ft in size. Trenches for cables would extend approximately 12 inches underground when cables would be needed to connect panel arrays. Solar arrays would be supported in one of three manners, depending on wind and geophysical conditions: • Concrete ballasts set at grade • Piles, either driven or screwed to a minimum of 4 to 5 ft in depth • Concrete footers that would be excavated, cast-in-place Unpaved access/maintenance roads would be sited and constructed from existing roads to access the site and individual blocks of arrays. The PV facility would connect to the Tiefort substation via an electrical tie-in line, which would either be trenched or installed at or below the height of the existing distribution lines in the vicinity
Alternative Site 1	Alternative 1 is to implement the Proposed Action on 380 acres of land approximately 0.25-mile inside the Fort Irwin main gate (Figure ES-1). The project area of the PV facility would be up to 250 acres within the proposed 380-acre Alternative 1 location. The PV facility would tie-in to the Tiefort substation, which is in the southern portion of the Alternative 1 site, via an up to 0.3- mile electrical tie-in line. The electrical tie-in line would either be trenched

	or installed at or below the height of the existing distribution lines in the vicinity.
Alternative Site 2	Under Alternative 2, the Proposed Action would be constructed on 390 acres of land southwest of the main security gate of Fort Irwin. The project area of the PV facility would be up to 250 acres within the proposed 390-acre Alternative 2 location. The PV facility would connect to the Tiefort substation, which is east of the Alternative 2 site, via a 0.7-mile electrical tie-in line, which would either be trenched or installed at or below the height of the existing distribution lines in the vicinity. Alternative 2 could include future development of an approximately 2.5- to 3.5-mile long utility line that would be placed along the south side of NASA Road and the west or north side of Fort Irwin Road to connect to a future microgrid to supply back-up power to critical Fort Irwin military facilities.
No Action Alternative	Under the No Action Alternative, no new construction would occur and no renewable energy facility would be developed. Use of fossil fuels and generation of combustion emissions would continue. The No Action Alternative would inhibit the ability of DoD and the Army to comply with energy-related, conservation-related, and GHG-related requirements and objectives.

Tribal lands within California

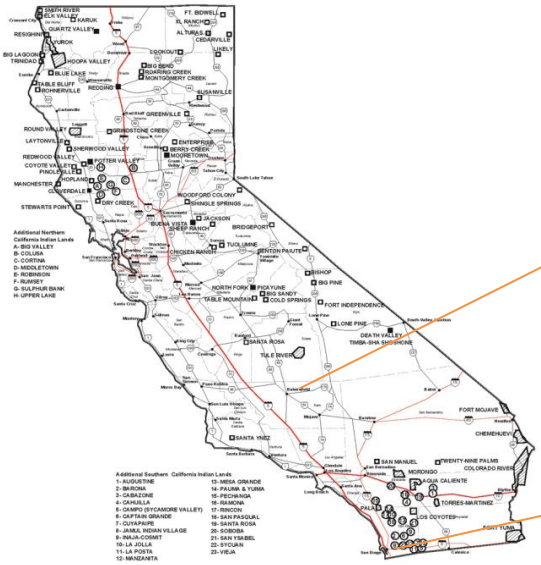


FIGURE 1-1
Vicinity Map
Proposed Solar Facility EA
Fort Irwin, CA

CH2MHILL

FIGURE ES-1
Alternative 1 Project Location
Proposed Solar Facility EA
Fort Irwin, California

FIGURE ES-2
Alternative 2 Project Location
Proposed Solar Facility
Fort Irwin, CA

CH2MHILL

Regulatory Setting

The proposed sites for construction are all on federal lands within the boundaries of Ft. Irwin and subject to federal regulations within those boundaries. Pathways, ranging from trails, paved and unpaved roads, leading to the construction sites would be subject to state regulation. The regulatory setting for the proposed Ft. Irwin PV Facility is predominately subject to federal statutes, regulations and executive orders; however, the state roads and surrounding communities leading to the project site will be subject to state regulation and may require additional permitting and mitigation. The Ft. Irwin EA provides a comprehensive list of the federal statutes, regulations and executive orders; however a list of permits, approvals and agreements potentially required by other agencies is missing from the referenced Appendix

A of the Environmental Assessment. Without more information about existing agreements and other agencies that may require permits, approvals or agreements, this assessment can only address the federal regulatory framework for this proposed PV array facility.

What is a Health Impact Assessment?

A Health Impact Assessment (HIA) may be defined as "A multidisciplinary process within which a range of evidence about the health effects of a proposal is considered in a structured framework … based on a broad model of health, which proposes that economic, political, social, psychological, and environmental factors determine population health."[9]

An HIA is generally conducted using the following six step approach:

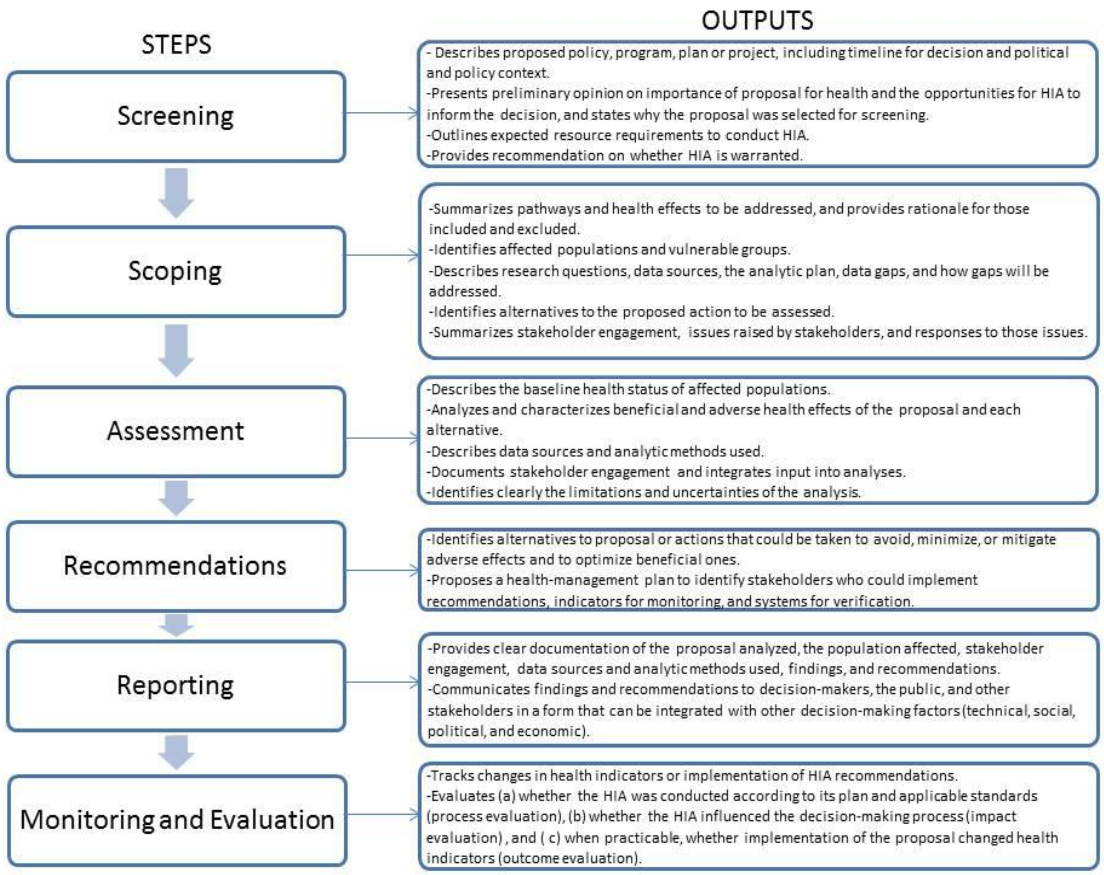


Figure 2 - Framework for HIA illustrating steps and outputs; Improving Health in the United States: The Role of Health Impact Assessment

[9] Improving Health in the United States: The Role of Health Impact Assessment, Table 1-1, p. 16. (http://www.nap.edu/catalog.php?record_id=13229).

Ft. Irwin Photo-Voltaic Array HIA

The purpose of this Health Impact Assessment (HIA) is to evaluate the potential health impacts of the proposed Fort Irwin photo-voltaic (PV) array facility which will be located in the Mojave Desert region of California, paying particular attention to the potential health impacts upon American Indian Tribes in the region. The section summarizes the results of the HIA process that was undertaken between April 2013 and March 2014.

Screening Stage

Screening is the first step in an HIA. It is used to evaluate whether there is need for an HIA and what level of effort may be required. This evaluation is based on factors such as whether an HIA will be useful and timely, and whether it will add value to decision-making.

In the Screening Stage of this HIA, it was determined that the Ft. Irwin PV array facility has the potential to impact tribal community health with respect to the determinants of sovereignty and self-determination as well as cultural revitalization. As a federally funded project, the Ft. Irwin PV array facility is subject to federally mandated Tribal Consultation, a process in which the tribes are contacted to discuss the potential impacts of the project. The siting and development of the military's renewable energy facilities may have potential health impacts upon tribal communities that are within the region or that have cultural affiliation with the region in which the facilities will be developed.

The proposed PV array facility may generate employment opportunities, increasing local access to health insurance and other resources to improve overall health. Additionally, increased electricity reliability to the Ft. Irwin will decrease pressure on the regional electrical grid which can deter the negative impact associated with electricity shortages. These factors were not examined in this HIA due to the time limitation on the HIA and the lack of public data concerning Ft. Irwin's electrical usage on the regional grid. There are also potential negative health impacts for tribal communities such as limiting access to and protection of tribal cultural sites, destruction of native plants and displacement of animals within and near the site. Because the project is receiving federal funding and may have an impact on tribal communities, consultation between the developer of the solar energy project and tribes within the project region must be conducted pursuant to the National Environmental Policy Act (NEPA), Native American Graves and Repatriation Act (NAGPRA), National Historic Preservation Act (NHPA), Archaeological Resources Protection Act (ARPA), American Indian Religious Freedom Act (AIRFA), and various Executive Orders. NIJC conducted the HIA in parallel with the NEPA, NAGPRA, NHPA, ARPA, and the AIRFA processes.

Key decision-makers in this process include the Department of Defense (DOD) particularly the Army at the Ft. Irwin Army Base (or military base), and potentially, Public Utility Commission, and the CA Department of Energy. Key stakeholders are tribal communities including the Fort Mojave Indian Reservation, Chemehuevi Indian Reservation, Colorado River Indian Reservation, and potentially the Timbisha Shoshone Tribe, Torres-Martinez Indian Reservation, Fort Independence Indian Reservation, Tule River Indian Reservation, Bishop Paiute Tribe and any other tribal communities with cultural resources within the project region. The Bureau of Indian Affairs, local public health agencies, community organizations, and local residents surrounding the proposed sites, local businesses, and state, tribal and local chambers of commerce are also stakeholders.

NIJC involved key decision-makers and stakeholders in the screening process through meetings, and telephonic and e-mail discussions. NIJC met with Erich L. Kurre of the Army Energy Initiatives Task Force, Serena G. Bellew, Acting Senior Advisor and Liaison for Native American Affairs for the Department of Defense, and John Baker, NEPA Planner for Fort Irwin during the screening phase to ensure the timeline of the proposed array facility and the NEPA process would allow sufficient time for an HIA, as well as to gauge their willingness to partner on the HIA and consider its recommendations in the site selection and decision-making process. NIJC also met with various tribal government representatives to identify their capacity and interest in participating in the HIA process and their perceived need for an HIA to fully analyze and address health concerns related to the proposed solar energy project.

Scoping Stage

The scoping phase of HIA is used to identify the health areas or health determinants that will be carried forward into the assessment phase and to determine the population groups that may be impacted. During the scoping stage of the HIA, NIJC established and met with the HIA stakeholders group to gather data concerning populations that may be impacted by the proposed project, studies of health as it relates to potential impacts upon cultural landscapes, reviewed relevant literature for health in general, tribal cultural health determinants, tribal identity and health impact assessments related to tribal communities. The stakeholder group for this HIA consisted of representatives from tribal historic preservation offices, tribal museums, and Ft. Irwin's planning and archeology departments.

Stakeholders:

1. Raymond Andrews, Tribal Historic Preservation Officer, Bishop Paiute Tribe
2. Margaret Cortez, Secretary/Treasurer, Timbisha Shoshone Tribe
3. Bill Eddy, Vice-Chairman, Timbisha Shoshone Tribe
4. Clarence Everly, Mojave Desert Ecosystem Program, Fort Irwin Military Base
5. Wilene Fisher-Holt, Cultural Resources, Colorado River Indian Tribes
6. Earl Frank, Executive Board, Timbisha Shoshone Tribe
7. George Gholson, Tribal Chairman, Timbisha Shoshone Tribe
8. Park Haney, Deputy Director, Office of the Assistant Secretary of the Army
9. Michael Huber, Program Manager, Department of Defense
10. Lenore Lamb, Natural Resources, Bureau of Indian Affaires
11. Priscilla Naylor, Tribal Historic Preservation Office, Ft. Independence Indian Reservation
12. Clyde Nichols, Executive Board, Timbisha Shoshone Tribe
13. Nora McDowell, Ft. Mojave Indian Reservation
14. Linda Otero, Vice Chairperson, Ft. Mojave Indian Reservation
15. John Rydzik, Division of Environmental, Cultural Resources management & Safety, Bureau of Indian Affairs
16. Arlene Tierney, Historic Preservation Officer, Quechan Tribe

Additional but limited participation was received from environmental protection and cultural resources staff from Chemehuevi Indian Reservation, Torres-Martinez Indian Reservation, Tule River Indian Reservation and the Inter Tribal Council of Arizona.

Figure 3, below, illustrates the linkages between the construction and operations activities of the proposed Ft. Irwin PV project and impacts upon tribal community health determinants and health outcomes as

identified by the HIA Stakeholder group and the HIA team. While plants, soil, air and water quality are accepted determinants of human health, tribal communities also have a cultural and spiritual connection with the natural environment. The natural environment within original homelands of tribes is their cultural landscape (otherwise known as sacred geography). The cultural landscape includes the physical environment (flora, fauna, soil, air and water) as well as the environmental elements that are part of the tribes' spiritual practices such as origin stories. Tribal stakeholders view the cultural landscape as part of wo they are and a necessary element to their cultural survival. Changes to or destruction of the cultural landscape occur particularly when the lands are not part of the tribal community; however, their spiritual significance is not diminished. Tribal communities should be engaged in consultation about any changes to the cultural landscape. They should receive notice that their spiritual places may be forever altered or destroyed. They should be given the opportunity to document the places before they are completely gone. They should be given the opportunity to administer ceremonies for the place before it is lost. To acknowledge the critical need to consult with Indian tribes regarding such historic properties, the NHPA was amended in 1992 to affirm that all Federal agencies are required to consult with Indian tribes regarding undertakings which may affect properties of traditional religious and cultural significance on or off Tribal lands. [10]

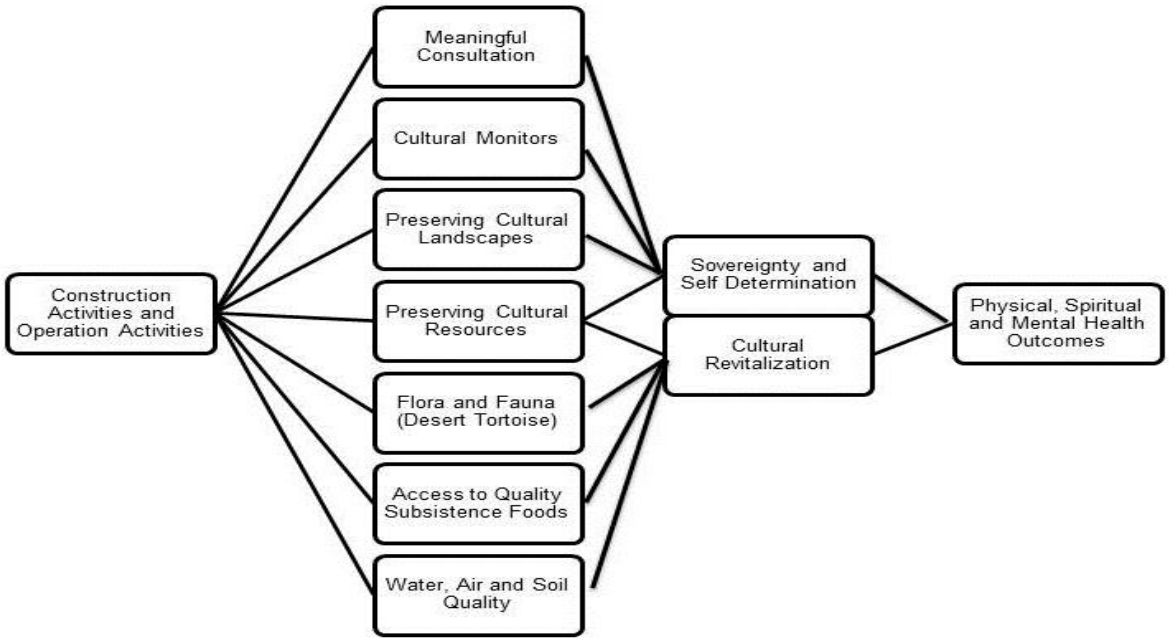


Figure 3 - Ft. Irwin PV Array Facility HIA Scoping Diagram

[10] Developing an Ecosystem Approach Model for the Consideration of Traditional Cultural Landscapes in Planning Transportation Infrastructure: Issues, Benefits, and Constraints, Stephanie Stoermer and Carole Legard, FHWA – FLH, p. 9.

Both the landscape and areas within the landscape may be considered tribal cultural landscapes. In some instances, places such as Mt. Shasta of California (due to its stature and known history) are easily understood as tribal cultural landscapes even though the landscape is not within tribal reservation boundaries; however, some areas cannot be readily identified without involvement of tribal communities indigenous to the area. Without inclusion of tribal communities in planning and construction of projects on and off of tribal lands, tribal cultural landscapes may be threatened or lost.

Affected Populations

Fort Irwin[11] is located 37 miles northeast of Barstow, California in San Bernadino County and near the Calico Mountains of the Mojave Desert region of California. According to the 2000 U.S. Census Bureau, there are 20,513 American Indians located in San Bernadino County. The proposed PV array facility may result in impacts to the following population groups: fourteen (14) Mojave Desert Tribal Communities, the Ft. Irwin community and the communities surrounding the pathways leading to and including the construction site. The fourteen Mojave Desert Tribal Communities that participated in this HIA are a subset of the tribes that were indigenous to the Mojave Desert and that are federally recognized. These tribes are the beneficiaries of the mandated consultation and coordination of federal projects that may impact tribal communities pursuant to EO 13175. This consultation and coordination is mandated for the purpose of providing tribes with an opportunity to learn about the project and to provide input into the project before the project begins. This includes planning stages of projects using federal funds. The Mojave Desert Region Tribes have been relegated to smaller portions of lands held in trust for their benefit by the federal government. While the boundaries of their homelands have changed, their cultural practices and spirituality are still tied to the cultural resources, cultural landscapes and sacred sites of the Mojave Desert. As a matter of physical, spiritual and mental health, any alterations or destruction of such cultural resources should be discussed with tribal communities in an effort to afford them the opportunity to administer cultural ceremonies and practices before destruction or to suggest mitigation strategies to lessen alteration. This HIA particularly examines the impacts upon tribal cultural resources for the Mojave Desert Tribal communities and has gathered mitigation strategies from the tribal stakeholders. In addition, this HIA examines the health impacts upon the Mojave Desert tribal communities that may result from the development of the Ft. Irwin photo voltaic array facility.

[11] 2010 U.S. Census Data is available at http://www.census.gov/2010census/popmap/ipmtext.php?fl=06:0625114 or use the following terms: "2010 Census Interactive Population Search: CA - Fort Irwin CDP". U.S. Census Bureau (2014).

Health data for the fourteen participating tribal communities was derived from the 2010 American Indian and Alaska Native Health Assessment in California, conducted by the California Rural Indian Health Board; 2014 California Area Indian Health Service Tribal Consultation; UCLA Center for Health Policy Research, AskCHIS Database; 2011-2012 A Health Profile of California's Diverse Population; 2010 Health of American Indian and Alaska Native Elders in California; and Stakeholder interviews.

The data collected focused on physical, mental and cultural/spiritual health as evidenced by existing tribal culture revitalization programs such tribal language programs and tribal historic preservation offices. The baseline health data collected is included in Appendix C. The baseline data includes information about the Mojave Desert Tribes, California Tribes in general, California Tribal Elders and the general population of California for comparison. For general health, Mojave Desert Tribes report 14.4% are in Fair condition and 31.3% are in poor condition. In comparison, California Indians as a whole report 25.6% of adults are estimated to have fair or poor overall health. Specific information about the Mojave Desert Tribes is limited. With respect to health ailments and conditions, Mojave Desert Tribes report very high rate of diabetes, high blood pressure, serious psychological distress. For the Heart Disease, they report 7,2 percent which is similar or less than California Indian communities. They reported better than average on health behaviors with cigarette smoking at 15% (13.7% lower than California tribal communities); binge drinking at 24.4% (5.2% lower than California tribal communities); and regular walking at 67% (32% higher than California tribal communities).

Assessment Stage

The Assessment stage of this Health Impact Assessment (HIA) analyzes the potential outcomes and impacts of the proposed Ft. Irwin PV project on the Mojave Desert tribal communities identified in the previous section.

Assessment Methods

To conduct the assessment of health effects associated with the proposed Ft. Irwin PV facility we engaged the following groups and used the following resources:

1. Direct stakeholder engagement.
    a. We conducted a face-to-face meeting of a small subset of the stakeholder group in Barstow, California on June 11, 2013. We also met or engaged with this group periodically throughout the HIA process to review project resource development such as the Tool Kit to assist stakeholders in responding to the Ft. Irwin PV Array Facility Environmental Assessment, to discuss literature review and tribal cultural resources and

to interview individual members of the stakeholders group concerning mitigation of the potential health impacts documented during the Assessment Stage of the HIA. NIJC engaged the stakeholders through webinar/conference calls and individual calls. Responses were recorded with permission of the stakeholder group during the webinars and recorded by hand during individual interviews. Resources were distributed pursuant to our distribution plan which uses e-mail, mail and fax distribution to assure that materials are accessible.

b. To engage with the surrounding communities, we conducted phone interviews to collect baseline health data and information about cultural practices and programs within the tribal communities. We also developed a Tool Kit for Tribal Communities to respond to the anticipated Ft. Irwin PV Environmental Assessment (See Appendix B). To engage with non-Indian communities near the proposed PV sites we distributed project information and announcements to the Ft. Irwin community through the Ft. Irwin stakeholders. We distributed information to the surrounding communities using electronic bulletin boards and actual hardcopy distribution for senior centers, emergency responders and health facilities within San Bernadino County. We also collected demographic, health and economic data from Census.gov, the Ft. Irwin military base community profile, morbidity data from Centers from Disease Control and Injury Prevention. .

2. Ft. Irwin Environmental Assessment (EA) – This document was used to better understand the options being considered for the PV project on the Fort Irwin site and to determine how various cultural resources may be impacted by the proposed project. The EA provides tribal consultation letters which describe the range and scope of Tribal Consultation conducted by Ft. Irwin.

3. Literature Review – We researched literature particular to HIA, photovoltaic and other forms of solar energy, cultural identity, and cultural connectivity. The literature review was completed to better understand the possible connections between the project and Native American health and wellbeing. Results of the literature review are presented in Appendix A.

4. Demographic and health data - These data were collected from the U.S. Census Bureau, Centers for Disease Control and Injury Prevention, Indian Health Services, California Rural Indian Health Board for the Ft. Irwin community, surrounding communities and tribes within the Mojave Desert region. This information was used to better understand the current health conditions and health vulnerabilities in the affected population and to draft the baseline health report.

All of this information was combined to reveal and explain the potential linkages between the Ft. Irwin proposed PV array facility development to potential health effects on Tribal and surrounding communities in the study area. The assessment of effects is separated into two sections: 1) a discussion of the eight topic areas assessed in the Ft. Irwin Environmental Assessment (EA) that are relevant to an assessment of effects on health impacts, particularly tribal cultural resources; and 2) a description of the culturally relevant determinants of health that may be affected by the proposed Ft. Irwin development.

Tool Kit for Tribal Community Response to the EA

In September 2014, the U.S. Army prepared an Environmental Assessment (EA) report entitled Power Purchase Agreement (PPA) for the Construction, Operation and Maintenance of a Photo-Voltaic Array at Fort Irwin, California. The Ft. Irwin PPA Environmental Assessment contains Ft. Irwin's findings, descriptions and proposed mitigation measures for project impacts. In addition, Ft. Irwin submitted a Finding of No Significant Impact (FONSI) which implies that there are no significant findings that require mitigation.

In conducting this HIA, NIJC found that Ft. Irwin sent letters to the tribes but that the letters lacked reference to consultation and consequently no tribes were actually engaged in consultation and coordination with Ft. Irwin. The HIA tribal stakeholders suggested development of a tool kit for tribes to respond to the Ft. Irwin Environmental Assessment as a last resort should consultation and coordination fail to manifest. A toolkit was developed, revised and then utilized by 8 of the 14 Mojave Desert tribal communities to solicit feedback on the EA from a community health and Tribal perspective. The toolkit is contained in Appendix B. Stakeholder responses were collected directly from completed toolkits as well as from interviews with the stakeholders. The remainder of this section summarizes a) a description of the EA findings, b) gaps in the EA assessment of the topic as identified by NIJC staff and HIA stakeholders, and c) mitigation measures to address the gap(s) as suggested by the HIA stakeholders for each of the topic areas addressed in the EA report listed below.

1. **Land Use Planning and Aesthetics**

    a. EA Findings: The EA focuses on the change in the view shed and the glare as the primary impacts upon the aesthetics for the surrounding communities.[12] Alternative site 1 for the proposed facility is within the cantonment, but the land use for the area has not been designated by Ft. Irwin. The environmental assessment notes that minor impacts to the aesthetics would occur from the change in the view shed if the PV array facility is constructed on either of the two proposed sites. The PV array facility will cause a glare of 2% sunlight equivalent to that of glare from a large body of water.

    b. Gaps in EA Assessment: Aesthetics are not defined but are presumed to be in alignment with current construction on Ft. Irwin. Aesthetics are a value driven determination and will vary among the impacted communities. For the Ft. Irwin community and the surrounding communities, the additional glare resulting from the facility will not have a direct impact to the nearest community due to its distance from the proposed sites.

[12] See PPA Environmental Assessment, p. 4-1.

However, any obstruction of the view of the cultural landscape may have an impact upon tribal communities who associate their origin stories, songs and other spiritual practices with that landscape (even prior to the construction of Ft. Irwin).

c. Suggested Mitigation Measures: There is no mitigation measure proposed by Ft. Irwin within this topic area for the nearby communities with respect to the potential glare resulting from the PV array facility due to the distance of those communities from the proposed sites. Change in the view shed may have a greater impact upon tribal communities that associate their cultural values with the cultural landscape of the Mojave Desert. Mitigation for this potential impact would include a formal consultation with the tribes on the specific issue of cultural landscapes to identify whether the proposed construction will inhibit tribal administration of cultural rites within this area or whether the construction will inhibit the view of sacred sites within the area. If the tribes note that a specific and unique cultural resource or element of the cultural landscape would be obstructed, mitigation measures would include the allowance of the tribes to obtain cultural resource materials such as plants from the area before construction, provide for ceremonial prayers for the area before it is altered by construction and to allow for photos or videos to capture images of the site and resources before alteration.

2. Geology, Soils, and Mineral Resources

a. EA Findings: The EA focuses on the physiographic characteristics of the Mojave Desert region which includes high mountain peaks, ridges and wide flat valleys and whether it is suitable for construction of the proposed project.[13] The environmental assessment states that there are no important geologic or mineral resources present at either site. There is seismic activity in the vicinity but not at Alternative Site 1 or 2. The noted concerns requiring some mitigation include temporarily increased soil erosion and exposure to dust which may include potential residual contaminants associated with previous uses of the property. The reference to previous uses of the property does not provide an explanation of potential residual contaminants for the sites.

b. Gaps in EA Assessment: The EA states that the potential geological impacts, soil erosion and impacts upon minerals are negligible. There is uncertainty as to the potential residual contaminants that may be exposed in dust. Identifying and measuring residual contaminants and mitigation for airborne dust will be essential for the protection of the

[13] PPA Environmental Assess, p. 4-3.

Ft. Irwin and surrounding communities. Mojave Desert Tribes moved through the region historically and the communities were known to bury their dead. It is possible that grave sites will be overturned during construction. Cultural monitors would enhance the protection of any gravesites.

c. Suggested Mitigation Measures: Ft. Irwin's noted concerns requiring some mitigation include temporarily increased soil erosion and exposure to dust which may include potential residual contaminants associated with previous uses of the property. Mitigation measures would be to provide ongoing sampling and reporting of contaminants found during the PV development to the Ft. Irwin and surrounding communities so that community members may have the information necessary to decide ingress and egress to their homes that will minimize their exposure to any contaminants that may not have been identified. For the potential overturning of old tribal graves sites or sacred sites within the sites, tribal cultural monitors should be included in the construction phase of the facility. Tribal cultural monitors may be used on construction of the facility, roads to the facility and even in the planning phase to assist in the effort to mitigate and to minimize irreversible damage to cultural sites.

3. Biological Resources: Rare, Threatened and Endangered Species

a. Biological Resources:

i. EA Findings: The EA focused on biological resources including plants and animals and their respective habitats. Ft. Irwin conducted a field biological resources survey which was conducted March 26-29, 2012.[14] 250 acres of creosote bush-white bursage series vegetative habitat will be permanently lost with the selection of either site. The loss of the habitat at these sites is noted as minimal because of the availability of other similar habitats on Ft. Irwin. The environmental assessment analyzes federally listed, state listed and other special status species of vegetation and found that they were not identified or not observed in the sites.

ii. Gaps in EA Assessment: For the Ft. Irwin and surrounding communities, the degradation of the present habitat will have an impact upon the view shed and will have environmental impacts on the animals that rely upon the vegetation.

[14] PPA Environmental Assessment, p. 3-5.

For Tribal communities, the vegetative habitat may include materials that the tribes could use for cultural resource activities.

iii. Suggested Mitigation Measures: Inclusion of tribal cultural monitors in the identification of native flora used by the tribes would enhance the viability of the native plants, if any, and mitigate any loss of the native plant habitat. While other habitats exist, these particular habitats would not have to be completely destroyed or wasted if the tribes could identify and remove plants that are of use to their cultural practices.

b. Rare Threatened and Endangered Species

i. EA Findings: The EA notes that there is no expected adverse impact upon general wildlife species noting that the wildlife could relocate to adjacent habitats. It also notes that direct loss of wildlife could occur during construction at either site. Noted mitigation includes the buffering of breeding birds and their nests.

ii. Gaps in EA Assessment: Wildlife in the Mojave Desert is a dynamic component of a sensitive ecological system. The Desert Tortoise population is a federal and state listed species in need of protection. The field surveys for the PV project sites have revealed key information which the EA is based upon. The general wildlife and desert tortoise field surveys were conducted over three day periods in March 2012 and April 2013. Due to the large PV project site and the changing weather patterns and events of 2014, wildlife and desert tortoise patterns may have been significantly altered with respect to the sites. The timeframes in which the surveys were conducted were in Spring of 2012 and 2013 which is a time when the desert tortoise is less active.

iii. Suggested Mitigation Measures: To mitigate any potential impacts upon wildlife, we recommend that Ft. Irwin consider an additional observation other than in Spring. An observation time during July to September when the desert tortoise is potentially more active may result in more reliable and accurate numbers of the existing desert tortoises at the site. This will in turn inform the mitigation efforts including the permitting process and expenses for removing the desert tortoises to a safer habitat.

4. Water Resources

a. EA Findings: The EA focused on surface water and ground water with particular emphasis on water quality, run off and potential contamination.[15] California has experienced a dramatic drought situation over the past three years. Although the recent weather patterns are improving water levels throughout the state, California is still in a drought. The environmental assessment identifies negligible impacts upon surface and ground water.

b. Gaps in EA Assessment: There is no readily available information about the sources of water for the Ft. Irwin and surrounding communities and whether those sources could be impacted by contaminated run off water resulting from this project.

c. Suggested Mitigation Measures: Use of best management practices (BMPs) such as berms during and post construction would be the primary strategy to mitigate water run off which could potentially contaminate drinking water for the surrounding communities, wildlife and vegetative habitats.

5. Air Quality

a. EA Findings: The focus of the EA was on project compliance with federal, state and local ambient air quality standards for the phases of construction, operation and maintenance of the facility.[16] Emissions are similar for the alternative sites. They include carbon monoxide, nitrogen oxides, volatile organic compounds, sulfur oxides, fine and coarse particulate matters (10 and 2.5) as well as other emissions from construction equipment, vehicles and fugitive dust. Emissions would be short term and primarily during construction.

b. Gaps in EA Assessment: Human impacts are minimal because of their distance of community housing from the construction site. Impacts on humans other than construction crew members would be from vehicle emissions primarily. There are potential impacts upon adjacent flora and fauna. There is potential risk associated with prolonged exposure. Asthma and respiratory illnesses could be aggravated among the construction workers and surrounding communities.

c. Suggested Mitigation Measures: Stakeholders generally agreed that a public timeline for construction including points when air quality may be less than standard would provide

[15] PPA Environmental Assessment, p. 3-23.
[16] PPA Environmental Assessment, p. 3-24.

the surrounding communities with enough information to choose alternative routes, employ air filtration systems and to generally protect themselves from poor air quality.

6. Noise

a. EA Findings: The EA focuses on land use and objective noise levels within the framework of the Army's environmental noise policies. The federal regulations for noise levels specifies that noise may be determined generally acceptable if between 65 and 75 dBA, with the exception of areas of sensitive receptors such as housing, schools, and medical facilities. In areas of sensitive receptors, noise levels must be less than 65 dBA. For the proposed facility, construction equipment is the primary source of temporary noise levels. During operation of the facility, sources for noise levels would be limited to deliveries and maintenance. As part of the EA, baseline noise levels for heavy equipment that would be used for the construction of the facility were listed at 50 feet and 100 feet distance from the construction site. The noise levels ranged from 70 to 83 dBA at the distance of 100 feet. The EA found that no sensitive receptors were located within that distance. The nearest noise sensitive receptors were noted at 1000 feet distance from the construction site.

b. Gaps in EA Assessment: The EA included an analysis of the noise levels on fixed sensitive receptors. It did not discuss the possibility of noise sensitive receptors endangered animal species that may exist in or move through the area at the time of construction.

c. Suggested Mitigation Measures: Noise impacts and any subsequent impacts to health are likely negligible during the construction and operation of the facility due to the distance of family and general housing. Mitigation measures for animal species are noted but not identified in the Environmental Assessment.

7. Cultural Resources

a. EA Findings: The EA focused on cultural resources in the area of potential effect (APE) for the proposed action. Ft. Irwin states that the definition of cultural resources includes prehistoric, Native American and historic resources.[17] Native American resources are sites, areas and materials important to Native Americans for religious, spiritual or traditional reasons. "The EA notes that the belief in the sacred character of physical

[17] PPA Environmental Assessment, p. 3-30.

places . . . is fundamental to Native American religions."[18] The environmental assessment notes that there are no adverse impacts to cultural resources as a result of no historic properties in the alternative sites, no known cultural resources known to the California state historic preservation officer and no response from the tribes to the consultation letters distributed by Ft. Irwin.

b. Gaps in EA Assessment: The tribal consultation letters included in the appendix to the EA did not include the term consultation nor do they request a meeting between the tribes and Ft. Irwin PV planners. Tribal stakeholders including tribal historic preservation officers were not aware of a request for consultation regarding the PV array facility. The mitigation measure identified in the EA is to contact the installation archaeologist should there be any inadvertent overturning of cultural resources during ground disturbance. While many tribal cultural resources described in academic archeological resources are overturned in major construction projects, there are also a number of tribal cultural resources that are above ground/within the landscape that may only be known to and of importance to the tribal community. This may be troubling for the project owners because there is no typical list of this category of tribal cultural resources. These tribal cultural resources are often plants, animals and locations that are part of the tribal history and origin stories. The importance of the confluence of environmental elements (fauna, rock structures, wildlife) representing cultural histories and cosmologies is immeasurable. The evidence of the existence of these environmental elements is important to every tribal generation.

c. Suggested Mitigation Measures: To mitigate any damages caused by lack of consultation or by disturbing/destroying cultural sites, Tribal stakeholders recommend National Park Service - National Register Bulletin 38 entitled Guidelines for Evaluating and Documenting Traditional Cultural Properties which addresses SHPO landscapes and cultural landscapes. One area of improved engagement concerning the PV project is to use Tribal Cultural Monitors during major project construction components that could result in overturned below ground tribal cultural resources as well as those tribal cultural resources that are above ground/within the landscape. Tribal Cultural Monitors often work with State Departments of Transportation during road construction. Stakeholders recommended that Fort Irwin consider the use of Tribal Cultural Monitors for all road construction, trench digging and any ground breaking construction activities. The Tribal

[18] PPA Environmental Assessment, p. 3-30.

Cultural Monitors will be able to provide immediate responses, resources and strategies as a tribal representative for the care and protection of tribal cultural resources.

8. Socioeconomics

a. EA Findings: During the construction phase, there would be a temporary increase in minor beneficial effects due to the lack of skilled labor and available materials in the Ft. Irwin and surrounding communities. So the primary socioeconomic impact will be the temporary and transient workforce that will construct the PV array facility. The PV array facility will not result in availability of cheaper solar energy to the surrounding communities. The project will produce energy for the Ft. Irwin community only.

   i. Increased Employment for Construction Trades– there is an expected 145 full time position in construction trades associated with the project. It is expected that the construction workers would be commuting or living temporarily in Barstow or nearby communities.

   ii. Increased Trade – estimated 10% of construction materials would be bought in from the local region. Sales volume is estimated at $149,534,300 which is a positive change of .33%.

b. Gaps in EA Assessment: The section entitled 3.9 - Socioeconomics and 4.8 Socioeconomics are missing adverse impacts to the local communities including more distant surrounding tribal communities associated with the estimated 145 construction workers that would be residing off-post. American Indian and Alaska Native communities have had an unfortunate share of impacts resulting from seasonal and transient work groups as well as impacts resulting from sudden increases in community wealth such as alcohol and substance abuse, prostitution and increased incidence and spread of sexually transmitted infections (STIs). There has been limited data gathering but there is compelling data surrounding transient workforces for mining projects in Alaska.[19]

   i. There is concern that without mitigation measures the Ft. Irwin and the surrounding communities would be similarly impacted by the PV projects. Sexually transmitted infections (STIs) are a serious and common concern in regions that are host to industries that experience influxes of temporary workers.

[19] See Health Impact Assessment, Point Thomson Project (June 2011), http://www.epi.alaska.gov/hia/PointThomsonCompletedHIA.pdf

The potential for an increase in STIs linked to the PV Project is possible during the construction phase, when the Project workforce will comprise of large numbers of temporary and transient workers.

ii. The geographic areas where STI increases have the greatest potential to occur are those communities that will act as construction hubs (sources of temporary housing, food and entertainment). In light of the recent measles and enterovirus (EV-D68) outbreaks throughout the United States, we should note that respiratory and gastrointestinal illnesses share similar causal pathways as STIs: the transmission of infection from one person to another, exacerbated by working or living conditions that bring people in close proximity to one another. An outbreak of infectious respiratory or GI illness could arise within a PV Project construction worker housing area or work site; or could originate within the local community, particularly if the PV Project-related demand for housing causes an increase in crowding among some (especially low-income) community members.

c. Suggested Mitigation Measures: Develop mitigation strategies for potential infectious diseases particularly sexually transmitted infections that are associated with temporary transient workforces. There were no mitigation strategies suggested by the stakeholders with respect to this health concern.

Assessment of Health Impacts on Tribal Communities

Tribal communities in California were subjected to religious, federal and state policies that sought to eliminate tribal people, culture, and communities. From the conversion practices of the Catholic missionaries to the militias reimbursed for killing Indians, tribal communities in California have survived horrific histories.[20]

Tribes in California could cite these histories as the basis or determinants for poor health; however, tribes in California and throughout the United States have responded to the devastating impacts of state and federal policies by asserting their sovereignty and maintaining their legal right to live pursuant to their own laws. In spite of a resurgence of federal policy in the 1950s known as the Termination Era designed to eliminate tribal governments in California, the Tribes in California have focused their efforts and resources on developing their communities within the scope of their community values. ***As reported in the 2010 American Indian and Alaska Native (AI/AN) Health Assessment in California, the major determinants of AI/AN health in California are 1) Sovereignty and Self-Determination, 2) Cultural Revitalization and 3) Access to Culturally Competent and Affordable Healthcare.*** Any action or project that positively or negatively impacts a tribe's progress towards the health determinants has the potential to impact the health of tribal communities. The first two determinants are the focus of the assessment of health impacts resulting from the proposed Ft. Irwin PV project.

1) ***Sovereignty and Self-Determination*** – Tribal sovereignty is the term used to describe the legal right of tribes to make their own laws and to be governed by those laws. Through federal policies and U.S. Supreme Court opinions, tribal sovereignty is subject to the federal policy and interpretation. State laws may only apply within Indian Country with the permission of Congress. An example of such permission is found in the passage of Public Law 280, applicable to the State of California. "[I]n 1975, Public Law (PL) 93-638, the Indian Self Determination and Education Assistance Act, reasserted the right of tribal governments to contract and compact directly with the federal government for funding and services and to exercise direct control over the resources. Three decades of self-determination have enhanced native participation in the design and management of a number of their own programs and services – including Tribal Health Programs, Tribal Temporary Assistance to Needy Families (TANF), housing, education and Head Start programs. Tribes are investing time, talent, money and traditional wisdom. Challenged by needs for tribal leadership and solutions, many AI/AN are reviving traditional practices for their own solutions. Tribes have been independent nations, managing land and having autonomous political, cultural and economic institutions, for millennia. Today, tribes in California strive

[20] California Research Bureau Report CRB-02-014, Early California Laws and Policies Related California Indians, September 2002.

to maintain, recover and restore powers and institutions of government and society. Tribes pursue these goals not because they do not want to cooperate with other governments, but because they have rights to have governments cooperate with them."[21]

Components of Sovereignty and Self-Determination were identified as being important for the assessment of health impacts for the Ft. Irwin project include meaningful consultation and preservation of cultural resources.

2) ***Cultural Revitalization*** – The prevalence of federal assimilation policies in the settling of the United States had devastating impacts upon tribal communities including the loss of lands, access to traditional cultural materials, banning of spiritual practices, loss of language and significant damage to the systematic passage of cultural information from one generation to the next by the removal of Indian children to boarding schools and later into foster and adoptive placements. "Native ways of thinking and doing things have endured. Many AI/AN view their traditions, like themselves, as survivors against all odds. As tribal communities in California reassert control over their own affairs, they invest in restoration of language, protection of ancestral and ceremonial properties, revitalization of ceremonies and crafts, and the defense of indigenous values and cultural practices. The use of traditional languages, ceremonies and other practices in California is growing again. Traditional healing, medicines, and spiritual ceremonies have not only persisted to this day, but are experiencing a rise in interest and application in a variety of ways. These cultural strengths continue to differentiate tribal communities and individuals from the other cultures of the U.S."[22]

The CDC and IHS are recognizing and promoting the role of tribal culture and cultural practices in the improvement of health outcomes for tribal people. It follows that impacts upon tribal cultural landscapes (that in which the tribal cultural stories, songs, plants, foods, flora are rooted) will also impact the health of tribal people. The planning of the Ft. Irwin project included outreach to tribal communities in an effort to engage the tribes in a legally required consultation process. The letters sent to the tribes did not mention consultation and no tribes responded to Ft. Irwin about the project. Consequently, the legally required consultation and coordination with the Tribes did not occur. In addition to the impact upon tribal sovereignty and self-determination, this also impacts tribal cultural revitalization. The absence of meaningful consultation is an impact that cannot be measured at this point; however, it was the means by which tribes could communicate to Ft. Irwin in a timely manner about the sensitive flora, fauna and sites which may be impacted by the project.

[21] American Indian and Alaska Native Health Assessment in California, 2010, pp. 36-37.
[22] American Indian and Alaska Native Health Assessment in California, 2010, p. 37.

Components of Cultural Revitalization were identified as being important for the assessment of health impacts of the Ft. Irwin project include: cultural landscape, flora and fauna, access to and quality of subsistence foods and cultural resources, and changes to water, air and soil quality.

The two health determinants that shape this health impact assessment of the Ft. Irwin project on the Mojave Tribes are (1) sovereignty and self-determination, and (2) cultural revitalization. The stake holders' responses through the toolkit and interviews focused on the following impact concerns. The table below identifies each health determinant, associated measureable impact, summary of the impact's effect and proposed mitigation measures.

Health Outcome / Determinant	**Summary of Effect**	**Proposed Mitigation Measures**
Sovereignty and Self-Determination		
Meaningful Consultation	Consultation is a federal requirement for projects that are funded with federal funds and in some cases state agencies have similar consultation requirements. . Ft. Irwin's invitation to the tribes to participate in the Ft. Irwin EA process did not include the word "consultation" which initiates a formal response from tribal partners. This resulted in lack of meaningful consultation with the tribes, as required by law. The lack of required consultation with the tribes precludes tribal contributions to the decision making process for the planning and construction of the PV array facility. Denying meaningful consultation is a violation of law and it prolongs the negative policies and assumptions that sought to destroy tribal communities and culture.	Consultation should be initiated by Ft. Irwin using a letter that identifies the project as requiring consultation and inviting the tribes to participate in a face-to-face meeting. Even if the project advances, the consultation should still be conducted in an effort to engage the tribes allowing them to lend their knowledge about the cultural landscape and resources to the project.
Cultural Revitalization		
Preservation of Cultural Resources	The EA does not identify any use of tribal cultural monitors within the PV project nor as mitigation factors. Tribal Cultural Monitors are trained both in identification of tribal cultural resources but also in work zone safety. They represent an effort by tribes to preserve cultural resources and are seen as an asset in the eyes of the Tribes.	Use of cultural monitors that will identify cultural resources prior to damage or destruction would be an asset to this project.
Alteration of cultural landscape	By ignoring the cultural and spiritual links between the Mojave Desert and the tribal communities and altering the cultural landscape, the tribal community members will suffer and grieve the loss of the elements of their origin stories and songs.	The cultural landscape of the Mojave Desert and its importance to the Mojave Desert tribal communities should be acknowledged and damage should be mitigated if possible. There is no doubt among tribes that their cultural landscapes have been altered if not eliminated in some instances. Regardless of this reality, efforts at mitigating any unnecessary alteration

		to the cultural landscape or allowing the tribes to prepare for the change will result in a transition to loss that has not been afforded to tribes before. Mitigation efforts may include allowing tribes to administer ceremonial prayers and rites to the site which gives the tribe a chance to culturally prepare for the loss.
Impacts upon Flora and Fauna (native plants, Desert Tortoise)	The EA states that there will be approximately 250 acres of native plants that will be lost at either site if the facility is developed. The surveys of the Desert Tortoise were conducted and the findings were that there were very few tortoise found at either site. The surveys were conducted in Spring of 2012 and 2013, a time that the Desert Tortoise is less active. There are alternative habitats that include the vegetation that will be lost and that may be where the Desert Tortoise could be relocated. The timing of the survey has been questioned by the HIA Stakeholder Group and their view is that Spring was chosen to minimize the chance that tortoise would be viewed.	To mitigate this negative perception, Ft. Irwin could conduct an additional survey in the Fall. An additional mitigation would be to allow for any native plants within the sites to be relocated to tribal lands if they are not currently available on tribal lands. Alternatively, Ft. Irwin could establish a partnership with the Mojave Desert Tribes to harvest native plants that are currently not on tribal lands.
Access to and quality of subsistence foods and cultural resources	The PV construction will result in the loss of vegetation and the potential displacement of birds and other animals that migrate through and near the site. Potential contaminants in dust, water run-off that impacts water and food sources for the birds and other animals could impact the availability and quality of subsistence foods and plants and animals used as cultural resources.	As identified in the EA, mitigation for this issue is to use high quality berms and skilled labor to install the berms correctly to avoid contaminated soil erosion and water run-off. Additional mitigation measures would be to employ cultural monitors that could identify any berm failures and communicate that to the tribal communities if there may be potential impacts to subsistence foods and cultural resources.
Impacts on water, air and soil quality	Tribal communities have jurisdiction over the water, air and soil quality on their tribal lands. The current tribal lands held in trust for tribal communities by the federal government are a subset of the tribe's original homelands. While they may no longer have jurisdiction over their original homelands, they still have an interest in those homelands and the cultural resources located on those lands. With respect to the PV facility's impacts on water, air and soil quality, current tribal trust lands are too distant from the proposed sites to be effected by the project's impacts on water, air and soil; however, they may have interests in any negative impacts to the cultural landscapes located at Ft. Irwin.	The only mitigation measure for potential negative impacts on water, air and soil quality would be to communicate such to the tribes in the region. Beyond informing them of the negative impacts, the tribes may be able to lend assistance in preserving or recovering damaged cultural resources.

Recommendations for Immediate Action by the U.S. Army Base at Ft. Irwin

Based upon the assessment, we make the following recommendations for immediate action to the U.S. Army Base at Fort Irwin in hopes of mitigating any negative health impacts and enhancing positive health effects of the proposed project:

1. The U.S. Army Base at Ft. Irwin should engage the Mojave Desert Tribes in meaningful consultation before construction begins.

2. The proposed Ft. Irwin PV array facility should employ cultural monitors to evaluate the sites for native plants used in tribal cultural practices and to identify cultural landscapes of importance to the tribes;

3. Where alterations, damage or destruction to the cultural landscape is anticipated or identified, the Ft. Irwin PV array facility construction contractor should inform the tribes within the Mojave Desert region and allow them to administer cultural practices, rites before the site is lost.

4. The Ft. Irwin EA team should consider an additional observation in an alternative seasonal time frame such as July to September when the desert tortoise is potentially more active may result in more reliable and accurate numbers of the existing desert tortoises at the site. This will in turn inform the mitigation efforts including the permitting process and expenses for removing the desert tortoises to a safer habitat; and

5. The Ft. Irwin PV array facility construction contractor should develop mitigation strategies for potential infectious diseases particularly sexually transmitted infections that are associated with temporary transient workforces.

6. The U.S. Army Base at Ft. Irwin should develop a quarterly meeting schedule with tribal representatives in anticipation of consultation for future projects. It will take time to establish the level of trust required for tribes to participate in meaningful consultation.

Monitoring and Evaluation Plan

NIJC will monitor the following indicators as part of its Evaluation Plan for this HIA. Results will be distributed pursuant to the project distribution strategy.

Evaluation Plan		
Indicator	**Performance Measure**	**Timing**
Sovereignty and Self-Determination		
U.S. Army at Ft. Irwin engages the Mojave Desert Tribes in meaningful consultation before the PV construction begins.	Ft. Irwin invites the Mojave Desert Tribes by letter or phone to a Consultation Meeting, specifically termed, and conducted at a specific place and time before PV construction begins.	January – April 2015
U.S. Army at Ft. Irwin will contract a construction company and include use of Tribal Cultural Monitors by the contractor.	U.S. Army will contract a construction company for the PV array facility. The contract will require use of Tribal Cultural Monitors. Tribes will train cultural monitors. Contractor will hire tribal cultural monitors.	Once construction begins which is unknown at this time. We assume that construction has been delayed in the same ration as the delay in publishing the EA. Estimated time for construction will be early 2016.
Cultural Revitalization		
U.S. Army at Ft. Irwin, their construction contractor, and/or tribal cultural monitors will identify any culturally relevant cultural landscapes that will be altered by the project.	Relevant cultural landscapes are identified. Tribes have the opportunity to document the site and administer to the site before it is altered. Discussions of how to minimize the alteration occur between the tribes, the contractor and Ft. Irwin.	Early 2016.
Mitigation of impacts upon Flora and Fauna (native plants, Desert Tortoise)	Ft. Irwin will conduct an additional survey of the Desert Tortoise in the Fall. Ft. Irwin will allow opportunities for the tribes to remove native plants to tribal communities that do not already have such plants.	Fall 2015
Access to and quality of subsistence foods and cultural resources	Identification and sharing of information with tribes about contaminants in dust, water run off that impacts water and food sources for the birds and other animals and could impact the availability and quality of subsistence foods and plants and animals used as cultural	Early 2016 - Ongoing

	resources. Tribes will disseminate the information among tribal members to avoid the impacts of identified contamination of resources.	
Impacts on water, air and soil quality	If impacts to water, air and soil quality occur, Ft. Irwin will share that information with Tribal communities regardless of whether the impacts occur on tribal trust lands.	Early 2016 – End of Construction

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APPENDIX A

A Review of Health Impact Assessment Literature

Concerning Tribal Communities and Solar Energy Projects

Conducted by the National Indian Justice Center

Summer 2014

Introduction

The purpose of this paper is part of a larger study funded by the Health Impact Project, a collaboration of the Robert Wood Johnson Foundation and the Pew Charitable Trusts to examine literature concerning how Native American Health may be impacted by the renewable energy project anticipated at Fort Irwin, located near Barstow, California. Renewable energy projects have the potential to alter the cultural landscape and natural resources of importance to the Native peoples of the Mojave Desert. "Cultural-natural resources" and sacred sites/landscapes are significant health aspects for Native peoples for cultural continuity because their identities and primary health factors, are inextricably tied to the land, its features and its resources.

These health dimensions have not been adequately explored or discussed in relation to renewable energy project development in California. The HIA will describe the following: the protective factors of the cultural-natural resources and sacred sites/landscapes that may be impacted by the renewable energy project; the process for tribal community participation in the environmental assessment; and recommend creative mitigations to maintain the health of Native peoples should they be adversely impacted by the project development. Additionally, the project will analyze social, physical and mental health risks associated with such impacts including diabetes, cardiovascular disease, alcohol and substance abuse, depression, and suicide. The HIA will be used to explore the effect of such projects on Native American communities that have traditional cultural ties to project sites.

The goal of this HIA is to increase decision makers' and stakeholders' understanding of the unique health risk factors Native Americans may experience as a result of project impacts to cultural-natural resources and sacred sites/landscapes with the hope of developing communication strategies and protocols between the Tribes, project stakeholders, and decision makers. The project will also identify, as relevant, protective health factors associated with the solar energy project upon tribal communities such as new

opportunities for employment and improved energy efficiency and reduced impacts upon the environment.

The available literature review evaluates risk and protective factors of Native American populations with connections to the Mojave Desert's (and specifically Fort Irwin's) cultural-natural resources and sacred sites/landscapes, as well as how those factors may be impacted by a renewable energy project. However, determination of shared characteristics between the HIA target population and those subject to study in relevant research is difficult. Tribal communities are culturally, socially and economically distinct from one another. Comparisons between Tribes within the Mojave Desert and U.S. Indian tribes, other tribal, ethnic or racial groups inside or outside the United States often results in more differences than similarities. The table below shows the characteristics of concern to NIJC's study and the similar characteristics of other groups found in the available research:

Characteristics of Target Tribal Population(s):	**Characteristics most likely shared with groups in relevant research:**
Are members of an indigenous community	uniform cultural heritage or ethnic group
Reside on tribal lands within tribal socio-economic construct and/or under tribal jurisdiction	socioeconomic poverty, high rates of violent crime, alcohol and substance abuse, poor school performance among youth, high rates of depression, attempted or completed suicide within Indian families, limited resources for socioeconomic issues, limited opportunities for employment, geographic isolation
Eligible or receiving services provided by the tribe	Connectivity to family, peer group, culture and community

Characteristics of Target Tribal Population(s):	Characteristics most likely shared with groups in relevant research:
Demographic ties to Mojave Desert (proximity, cultural or historical ties to the area)	Connection to Cultural-natural resources and sites/landscapes.

The Purpose

This review is guided by the following goals/objectives:

- To examine the health risk and protective factors for Native American communities associated with the Mojave Desert.
- To identify potential health impacts associated with changes in access to resources that are part of tribal cultural practices, including traditional foods, as well as changes in substance abuse and mental health.
- To identify potential health benefits tied to the renewable energy project, including improved air quality from reduced emissions and opportunities for employment with health insurance.
- To recognize environmental risk and protective factors for Native American communities associated with the Fort Irwin Project.

The Problem

Indigenous communities are connected to the land, environment and animals that live in it. "A tribe's natural resource base is a source of cultural identity and religion, a nutritional and medicinal buffer against poverty, and a reservoir of environmental knowledge and biodiversity" (Harris and Harper, 1999). For thousands of years, the Mojave Desert has been sacred to the indigenous populations living in and near it. The Mojave Desert has been affected by numerous projects. According to the Sacred Natural Sites: Guidelines for Protected Area Managers report, in the 1990s, Ward Valley was used as a nuclear waste storage area, which "Not only would a nuclear waste facility disrupt the untouched landscape, but it could potentially threaten the water supply of local residents, and the habitat of the endangered desert tortoise" (Wild & Mcleod, 2008). Fortunately, the Native tribes and outside community members were able to prevent the government from moving forward with plans that would have been detrimental to these important cultural-natural resources.

Since 2009 there has been an influx of solar energy development in the Mojave Desert on state, tribal and federal lands. This influx was in part due to passage of the American Recovery and Reinvestment Act of 2009 (ARRA), wherein $80 billion was made available under the act for clean energy investments. To facilitate green energy development in California, the Department of the Interior began "fast-tracking" solar energy projects to meet the ARRA timelines. (Press Release 11/05/2009) This effort was part of President Obama's green energy initiative. With respect to lands on BLM public lands within the Mojave Desert, green energy projects have been "fast-tracked." This fast-tracking meant that many of the established means of communication, collaboration and consultation with Tribes were bypassed or skipped. The fast-tracking process itself creates a situation that exacerbates historical trauma by removing a means that Tribes and tribal communities have to protect their cultural interests and have input into projects developed within their ancestral homelands.

During the project permitting process Native access to cultural-natural resources and sacred sites/landscapes and the adverse impacts of renewable energy projects on these resources are typically broached as cultural-natural resources management issues and not as health issues. Cultural-natural resources and sacred sites/landscapes are significant health assets for California Native peoples who consider maintenance of their cultural identities to be a primary health protective factor. These health dimensions have not been adequately explored or discussed in relation to renewable energy project development in California. The special connection indigenous peoples have to cultural-natural resources and sites/landscapes that have been deteriorated or destroyed threaten their existence. The Mojave Desert remains a significant location for solar energy development and thus the potential impact to community health remains.

Cultural-Natural Resources and Sacred Sites/Landscapes and Health

For indigenous peoples, cultural-natural resources and sacred sites/ landscapes, land or water, have special spiritual connection and significance to them, a connection to the greater universe and well-being (Wild and Mcleod, 2008). Cultural-natural resources and sacred sites/ landscapes are considered the home and heart of indigenous communities, where their nature spirits, ancestors, and deities. Sacred sites/ landscapes are often used for sacred ceremonies, prayer and meditation. Indigenous people's cultural identity is often rooted in the cultural-natural resources and sacred site/landscape (Wild and Mcleod, 2008). Cultural-natural resources and sacred sites/landscapes occur at a variety of scales. They

can be as small as a single tree or rock formation, or can extend to an entire mountain range. In some cases, whole landscapes are regarded by a community as sacred, containing within them areas of more special sacred focus (Wild and Mcleod, 2008).

Additionally, maintenance of a cultural-natural resources and sacred sites/landscapes are associated with cultural identity. Among the many markers of indigenous cultural identity, the attachment to land and the use of an indigenous language are two of the most significant (DESA, 2009). The survival and development of indigenous peoples' particular ways of life, their traditional knowledge, their handicrafts and other cultural expressions have, since time immemorial, depended on their access and rights to their traditional lands, territories and cultural-natural resources and sacred sites/landscapes. Yet, the land base is not only part of the indigenous economy; it also has a deep spiritual relationship with the land. For example, indigenous peoples feel responsible for the healthy maintenance of their ancestral land—its waters and soils, its plants and animals—for both themselves and future generations (DESA, 2009). Land is where their ancestors are buried and where sacred places are visited and revered as indicated by some that often name the place to show the connection (DESA, 2009).

Land is the basis for the lives, cultures and identities of indigenous peoples. Since the colonial period, indigenous peoples have been dispossessed of their lands or faced the threat of dispossession and forced removal, leading to increased poverty, erosion of cultures and even outright extinction or complete assimilation (Wild and Mcleod, 2008). In recent years, there has been some progress but in reality, indigenous peoples today continue to face the threat of dispossession of lands and the associated health risk factors.

Wilson (2003) conducted 17 in-depth interviews with Anishinabek (Ojibway and Odawa) in Ontario, Canada, to show that the land, as place, is an integral part of First Nations people's identity and health. Wilson used a cultural approach in her research to understand the link between health and place. Interviews described a strong connection between Anishinabek and earth, which showed positive emotional and mental health.

Indigenous spirituality is intimately linked to the environment in which the people live. For indigenous peoples, the land is the core of all spirituality and this relationship to the spirit of the earth is central to all

the issues that are important to indigenous peoples today (Wild and Mcleod, 2008, p. 59). For many indigenous peoples, having a healthy sense of spirituality is just as important as other aspects of mental, emotional and physical health. Indigenous peoples believe that the land is alive with spirits which provide a positive mental and emotional health (Wilson, 2003, p. 90). It is important to realize that a healthy spirit is essential for indigenous people to live a healthy life. Mainstream society is beginning to realize that spirituality is an element that must be taken into serious consideration when dealing with indigenous communities (DESA, 2009, p. 61)

Impacts to Cultural-Natural Resources

"Indigenous individual and collective health is derived from membership in a healthy community that has access to ancestral lands and traditional resources, and from having the ability to participate in traditional community activities that help maintain the spiritual quality and continuity of the resources" (Harris and Harper, 1999). The connection between colonization (cultural losses, cultural resources, cultural alienation, and environmental degradation) and poor health have been documented in various areas nationwide and internationally with relation to cultural connectivity as a protective factor for the health of indigenous populations.

For generations, indigenous populations in the United States have been the target of federal and state policies and services that have effectively devastated healthy Tribal communities and families (Weaver, 2010). The aftermath of these policies can be seen in high rates of chronic disease, alcoholism, suicide, cancer, injuries and family violence (CDC, 2012). According to U.S. Department of Health and Human Services, National Center for Health Statistics, Centers for Disease Control, 2010, American Indian and Alaska Natives have long experienced lower health status when compared with other Americans (Weaver, 2010). For example, alarming statistics are found in the following:

- *Diabetes.* American Indian/Alaska Native adults are twice as likely to have diagnosed type 2 diabetes than non-Hispanic whites.
- *Cardiovascular disease.* Heart disease is the leading cause of death among American Indians and Alaska Natives. American Indian/Alaska Native adults are twice as likely as White adults to be diagnosed with heart disease.
- *Alcohol and Substance Abuse.*

- *Depression.*
- *Suicide*. The second leading cause of death for American Indian/Alaska Natives between the ages of 10 and 34 (2009).

Baseline Health Conditions (See later work)

Risk Factors

There is no specific literature examining the health risk factors of solar energy development for Native American populations. We turned to literature reviewing risk and protective factors among Native American and indigenous populations based on access to cultural-natural resources and sacred site/landscapes. Much of the risk factors experience by indigenous populations are also associated factors that make Native American communities vulnerable populations, including: cancer, poverty and unemployment, alcohol and drug use, lack of cultural connectivity, lack of effective response to cultural-natural resources, sacred site/landscape degradation. Geographic isolation, cultural barriers, economic factors, suspicion toward traditional spiritual beliefs, and inadequate sewage disposal are some of the other reasons why health among Native Americans is poorer than other groups (Donatuto et al., 2011).

Using the public health model, risk factors may be categorized into individual, relationship, community and societal factors.

Factors increasing adverse health impacts **(Table 1)**			
Individual	**Relationship**	**Community**	**Societal**
Poverty and unemployment; Alcohol and drug abuse Lack of cultural identity	Economic stressors; Social isolation and depression; Early aggression; and Lack of cultural connectivity	Community wide poverty and unemployment; Geographic and Social isolation; Limited access to	Policies that create and sustain economic and social inequality; Poor rule of law; Limited influence/input in projects impacting cultural-natural

		traditional foods and medicines	resources and sacred sites/landscapes

Early Aggression/Violence in the Household/ Juvenile Delinquency

Indian youth between the ages of 18 and 24 suffered a rate of one violent crime for every four persons (the highest rates of violent victimization than any other ethnic group surveyed).

Sixty-nine percent (69%) of Indian children report exposure to violence. Seven out 1,000 Indian women are victims of rape or sexual assault (Perry). The exposure of children to intimate partner violence has devastating consequences for the children, victim and the perpetrator. Studies of domestic disturbances in which police intervene have found that children are present in 41% to 55% of the incidents (Rudo citing Hinchey and Gavelek, 1982). Estimates of the number of children who witness violence in their homes range from 3.3 million per year to between 3.8 and 6.6 million per year (Rudo citing Carlson, Westra, 1984). Children may suffer injury by attempting to intervene in the violence as well as other impacts which are subjects of continued research (Rudo, 1996). Harwell et al. (2003) found a correlation between young age and physical violence among American Indian men, and physical violence and IPV among American Indian women. Additionally, research showed that of the men and women reporting physical violence, they were likely to be younger and report more days of physical and health problems during the past month (Harwell et al., 2003). Blum and Ireland (2004) found that rage or early aggression was the strongest risk factor for every health compromising behavior for both genders, and across all age groups in their study of 15,695 schools going adolescent youth from Caribbean countries. The next highest risk factors included skipping school and a history of abuse.

Alcohol and Drug Use

Alcohol and substance abuse among Native American adolescents (aged 12 to 17) is higher than any other racial/ethnic groups in the United States (SAMHSA, 2011). The higher incidence of alcohol and drug use among Native American populations increases their incidence of various negative health consequences both physical and societal. Native Americans experience higher incidents of chronic liver disease, alcohol-related automobile crashes, suicide, homicide and fetal alcohol syndrome (Beauvais 1998).

Additionally, alcohol and drug use has been linked to increased incidence of violence within Native American communities. Alcohol consumption prior to or during the commission of any crime was present in 46% of all convicted American Indians in local jails serving time for conviction of that crime. When only violent crimes are considered, the percentage rises to 70% (Luna-Firebaugh, 2006.) In their research, Malcoe et al. (2004) used the existing Conflict Tactics Scales with an additional question on forced sex. Interestingly, they did not report any correlating data on alcohol or substance use during the incidents of violence. Luna-Firebaugh (2006) states that the STOP VAIW programs reported 85% of the incidents that they handled were alcohol related.

Lack of Effective Governmental Response

There is significant research linking the incidence of violence in Tribal communities and the ability of Tribes to effectively respond to acts of violence within tribal jurisdictions. This is easily tied to the long standing void in the relationship between tribes, states and the federal government concerning jurisdictional authority over crimes within tribal reservation boundaries. Tribes are not part of the state jurisdictional framework. Thus, automated processes for registering state court orders with state law enforcement are not present for tribal court orders including protection orders. In addition, most tribes lack the resources to implement their own process for protection orders within the reservation boundaries. The failure of the state judicial system to afford full faith and credit to tribal court orders must be explored. Additional research indicates that this lack of effective governmental response leaders to increased incidents of stress and suicide within Native American populations (First Nations 2002, p. 27). For example, a Canadian study of first nations saw a direct correlation between self-government, land claims and education and reduced rates of youth suicide (First Nations 2002, p. 27). Further research may be needed, but the available literature suggests that lack of governmental response (either through resources or ability) to issues of importance to Native American communities can have a direct link to increased levels of stress, depression, and other risk factors.

PROTECTIVE FACTORS

Cultural Landscapes and Holistic Health approaches

Native American access to and control over their cultural-natural resources and sacred sites/landscapes is a vital component to emotional and physical health. Abraham, Sommerhalder & Abel (2010) presented a

literature review that conceptualized landscape as a health resource that promotes physical, mental and social well-being. Physical well-being is promoted through the promotion of physical activity in daily life as well as leisure time and through walkable environments (Abraham, Sommerhalder & Abel, 2010, p.62). Mental well-being is acquired through attention restoration, stress reduction and evocation of positive emotions (Abraham, Sommerhalder & Abel, 2010). Social well-being is promoted through social integration, social engagement and participation, and through social support and security (Abraham, Sommerhalder & Abel, 2010).

According to Abraham, Sommerhalder & Abel (2010), the three health dimensions (mental, physical and social well-being) findings were divided into three subsections, which presented the following results:

- *Attention restoration and recovery from mental fatigue.* Natural landscapes (i.e. beaches, forests, mountains) showed more restorative than urban settings. People were able to recover from mental fatigue when exposed to a natural landscape
- *Stress Recovery.* Visual stimulation—as soon as people are exposed to a natural environment, their stress levels reduce because the landscape is perceived as pleasant- negative feelings are replaced by positive feelings such as interest, cheerfulness and calmness. Also, low sound-levels revealed rest and relaxation
- *Positive emotions.* Landscape perceived as pleasant and amount of open space and vegetation.
- *Social integration.* Landscape characteristics include: parks, community gardens, sufficient level of safety, attractive, walkable and rich in vegetation, to name a few.
- *Collectively experiencing nature.* "Wild" nature—nature experience facilitates a sense of equality and community, social decision-making and responsibility, and social bonding and support, and feelings of being protected.

The protective factor of these concepts is seen with respect to indigenous populations through therapeutic medicine and holistic medicine concepts. Therapeutic landscapes encompass both the physical and psychological environments associated with treatment or healing. They have an "enduring reputation for achieving physical, mental and spiritual healing" (Williams, 1998, as quoted in Gesler, 1993, p. 171). Holistic medicine is used in reference to humanistic geography. The following concepts were derived in association to holistic medicine:

- Symbolic landscapes, importance of meaning, value and experience. For example, incorporation of individual and/or cultural belief systems and basic element in therapy (i.e. aboriginal medicine wheel)
- Sense of place. Formation of environments through human networks of care (i.e. aboriginal hospitals and birthing centers).
- Authentic and unauthentic landscapes. Imagery in accessing healing environments (visualization).
- Landscapes of the mind. Interpretation of health conditions (i.e. art therapy).

Further research is needed to examine the connection between landscape and treatment. (Mark, G. T., & Lyons, A. C. (2010).

Cultural Connectivity

Related to cultural landscapes and Native American health is the concept of indigenous identity being linked to cultural-natural resources, sacred sites/landscapes. For example the following foundations of indigenous identity were noted in relation to the health and well-being:

- Values that privilege the interrelationships among the spiritual, the natural, and the self;
- A sacred orientation to place and space;
- A fluidity of knowledge exchange between past, present, and future; and
- An honoring of language and orality as an important means of knowledge transmission.

If these tenets of indigenous identity are accepted, the question that follows is how concepts of cultural identity pertaining to indigenous identity can relate to the health and well-being of peoples and communities (Greenwood & de Leeuw, 2007, p. 50).

Intergenerational education and cultural continuity of indigenous identity is done through story and can be learned from the land and from connections with the land and from the stories that Elders tell us about the land and our relationship to it (Greenwood & de Leeuw, 2007, p.53).

Malcoe et al. (2004) note the unique history of the tribes relocated to Oklahoma in the 1800s including the impact of the General Allotment Act and the Jerome Agreement which dissolved general trust land status of tribes in favor of trust lands for individual Indians. This resulted in a great loss of land to non-Indian settlers and the loss of communal living practices among the families and clans of these tribes. The authors fail to note that these are distinct and unique characteristics of the Oklahoma tribes. Tribal self-identity is often associated with a recognizable and definable tribal community that engages in visible tribally specific practices including cultural, spiritual, governmental and social practices. These aspects of tribal identity are recognized protective factors against violence, but are likely additional factors for protecting against other risk factors.

Hall et al. (2005) found that a strong ethnic identity may lead to positive perceptions not only of one's own ethnic group but also of those outside one's ethnic group. Perceived minority status was negatively associated with sexual aggression among Asian American men suggesting that perceived minority status is a protective factor. Hall et al. (2005) also found that loss of face is a protective factor that is more relevant to Asian Americans. Blum and Ireland (2004) found that school connectedness was the strongest protective factor for every health-compromising behavior for both genders, and across all age groups in their study of 15,695 schools going adolescent youth from Caribbean countries. Protective factors included family connectedness, other adult connectedness, school connectedness, religious attendance, and religiosity.

Indigenous knowledge is embedded in community practices, institutions, relationships and rituals and is inextricably linked to indigenous peoples' identity, their experiences with the natural environment and hence their territorial and cultural rights. Indigenous peoples therefore place a great deal of importance on passing this knowledge on to future generations—not only for the sake of preserving the knowledge, but also for preserving their own cultures and identities (DESA, 2009, p. 65).

The interconnectivity of Indigenous people, their cultures, and ways of life with the land, and the health of Indigenous peoples is linked to the connection to the land. Indigenous people's culture grows stronger from this connection. This connection is argued to be a connection and may potentially be related to a holistic understanding of health. The health and well-being of Indigenous children, their communities, and ultimately their nations arises from this connection with the land and from strength of culture that grows from this connectivity (Greenwood & de Leeuw, 2007).

Environmental Components

In addition to the health risks associated with impacts to cultural natural resources and sacred sites/landscapes there are also the environmental impacts and associated health risks. Both in the literature and this HIA it is important to distinguish between environmental components and the more overarching cultural-natural resources and sacred sites/landscapes. Literature is available regarding health risks and benefits associated with solar energy production. However, the environmental factors identified flora, fauna, air, water, soil, etc. are not in themselves cultural-natural resources without the appropriate cultural relevance. Likewise there are additional relevance and important to some environmental components that will only be available through interviews and discussions with tribal representatives. Much of the literature pertaining to environmental components addresses similar solar energy projects, or other projects within the Mojave Desert. There are various environmental risks that could impact health including:

- Soils
- Water resources
- Desert ecosystems
- Air quality
- Significant species
- Corridors
- Important bird areas
- Visual and sound pollution
- Project footprint

Since there are various Tribes who consider the entire Mojave Desert as culturally important any disturbance within the bounds can be considered an impact to the landscape. Additional concerns are due to limited research, there is a level of uncertainty regarding the long term effects of some solar energy production on deserts like the Mojave (Allen & McHughen, 2011). There is also significant research dealing with the potential benefits of solar energy specifically related to climate change and air quality improvement resulting from reduced use of fossil fuels.

In addition, to the environmental components above there is the related risks posed to Native American communities in North America, who are vulnerable to environmental injustices (Goldtooth 1995; Weaver 1996) due to contamination of the natural resources on which many community members continue to depend (Harris and Harper 2001; USEPA 2002; van Oostdam et al. 2005).

Native American Tribes of the Mojave Desert

There are numerous projects within the Mojave Desert near or on Native American Homelands. Many of these projects have necessitated suits and comments addressing the real and potential impacts associated with Solar Energy Projects. These concerns are varied and incorporate issues with what are often characterized as either or both Natural/environmental/biological resources and/or Cultural connectivity/cultural resources/ sacred sites. There are underlying themes that are included in voiced concerns that are consistent throughout development of Solar energy projects within the Mojave Desert. First, the entire Mojave Desert is considered sacred for many tribes. That is in part because, many of the Tribes within the region did not have generalized cremation or burial sites, so tribal ancestors are buried throughout the Mojave Desert. (Fisher-Holt, 2014) In addition to burial sites, there are petroglyphs and rock art, and trails throughout the region that hold special significance to cultural continuity. (Musser-Lopez & Klasky) Cultural resources could also include viewsheds from trails or other significant sites, the sound factor of an area, the olfactory elements of an area. All of these aspects of the Mojave Desert can be considered sacred. They are part of the Tribe's cultural continuity, part of tribal history and creation stories, and remain a part of contemporary cultural identity, teachings, practices, and life ways. (*Id*., & USFS Sacred Sites report)

CONCLUSION

The available literature address many of the scoping questions posed, however there is nothing specifically addressing the health impacts associated with impacts to cultural natural resources and sacred sites/landscapes. More research exists regarding potential health impacts relating to environmental components, however, long-term research analysis of environmental issues associated with the Mojave Desert is limited. There is significant and informative research on the risk factors associated with Native American populations as a result of their status as a vulnerable population. Additionally, there is growing research on the protective factors associated with cultural-natural resources and sacred sites/landscapes. Relying on this research, Native American populations experience many risk factors and exacerbation of existing risk factors including cancer, early aggressive behavior, juvenile delinquency, alcohol and drug

abuse, and a lack of an effective governmental response (Weaver, 2010). The presence of these risk factors has been the norm in many tribal communities since the development of the Rancheria/reservation system. Despite these risk factors, there is potential for improved and reduced health impacts associated with cultural landscapes and promoting cultural connectivity. Likewise, improved communication and tribal self-governance to protect these resources may produce similar health benefits. The issue that needs to be addressed is the potency of protective factors, with specific attention to the protective factor of cultural connectivity.

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Environmental Impact of Solar Power

http://www.ucsusa.org/clean_energy/our-energy-choices/renewable-energy/environmental-impacts-solar-power.html

http://www.eenews.net/public/Landletter/2009/10/08/1

Health Impacts Associated with Climate Change using Renewable Energy

http://www.epa.gov/statelocalclimate/local/topics/health.html

http://srren.ipcc-wg3.de/report/IPCC_SRREN_Full_Report.pdf

APPENDIX B

Tool Kit for Tribal Community Response to the Environmental Assessment for the Fort Irwin Photovoltaic Installation

The following document is a template or tool to assist in providing a response to the solar energy projects in the Mojave Desert. This is crafted to look at the Fort Irwin photovoltaic installation Environmental Assessment. However, it can be used for other solar energy projects as relevant.

I. Requirements of an Environmental Assessment: Use this section to analyze whether the EA has the requisite components.

A. A clear and concise description of the proposed action.

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
"clear and concise description" should include: drawings, maps, and charts, if directly pertinent to analyzing environmental consequences of the proposed action;	

B. A statement identifying the purpose and need for the proposed action

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
This is the reason why this project is being done, versus not being done	

C. Alternatives to the proposed action, including the no action alternative

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
Is there an alternative action that may be taken that increases positive results or decreases negative results with respect to the tribal community, culture and landscape? Provide a detail based upon evidence or prior experience that supports your comments.	

D. A description of the existing environment affected by the proposed action and alternatives to the proposed action**, in sufficient detail** to permit a meaningful evaluation of the potential environmental consequences of the proposed action.

1. **Cultural Resources**

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
Discussion of full extent of cultural resources including: Usually includes burial sites, ceremonial items, and various other "cultural items" or traditional cultural properties as defined under acts like NAGPRA, NHPA, AIRFA, and ARPA These Acts generally require that "cultural items" or "cultural resources" be defined either by the appropriate authoritative representative of the Tribe (Executive Order 13007) or by the Federal government in consultation with Tribes (NHPA) To the extent possible, identifying "cultural resources" will facilitate ensuring they get the most protection they can under an Environmental Assessment. It is appropriate to identify that they exist, but that specifics must be provided in a confidential matter to protect said resources. Possible Cultural Resources to discuss/identify: • Landscapes • burial sites • rock art/ petroglyphs • Trails – associated with "salt songs", community history, creation stories, etc. • Historical sites	

• Sacred sites • Subsistence resources- are there any flora or fauna subsistence sources within the site or that would be impacted by the project. • Medicinal resources - are there flora or fauna used for medicinal purposes within the site or that would be impacted by the project	

2. **Biological Resources**

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
Descriptions of potential biological resources that may be impacted by the project include the more physical aspects of the ecosystem. There may be overlap between discussions of biological resources and cultural resources. For example the importance of water resources or specific wildlife can be described in both biological ecosystem health terms, as well as cultural or spiritual significance. Possible Biological Resources to discuss/identify: • Water resources: 1. Will the project use water? 2. How much? 3. Where is the source? 4. What kind of health impact will be associated (i.e. changes in water availability, quality, etc.) • Air quality: 1. Will the project emit air pollutants? 2. What are the health implications of contaminated air? 3. Which communities are at risk of poor air quality? • Soil:	

1. What is the level of soil disturbance? 2. What is the potential for air contamination from soil disturbance? 3. What is the impact of soil disturbance on "cultural resources" (see above)? • Viewsheds or Viewpoints of Environmental Elements: • Are there any views of any environmental elements that will be preserved, altered or eliminated by the project? • Are there any views of specific tribal cultural elements within the viewshed that may be preserved, altered or eliminated by the project? • Wildlife: 1. Are there potential impacts to populations, breeding habitat, migration corridors? 2. Are there potential impacts on the access to necessary habitats? 3. Is there any glare affecting or altering natural migration? 4. Will protective fences impact standard migration? • Other issues: 1. Are there any flora or fauna used for ceremonies within the site? 2. Are there any flora or fauna important to tribal culture, history, etc.? If there are no specific biological resources you can discuss general importance of overall landscape or ecosystem and role of wildlife.	

A description of the existing environment affected by the proposed action:

3. **Visual Resources**

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
The Visual Resources section may have overlap with cultural resources. This section will allow for greater discussion of the visual landscape. Some items to include are: Landscapes, visual site lines from important trail systems or vistas that make up important to various cultural resources (creation stories, Salt trails, songs, community history, etc.)	

E. An assessment of potential impacts of the proposed action and alternatives to the proposed action, including direct, indirect, beneficial, adverse, significant and not significant;

How will the project effect the resources referenced above in a beneficial, adverse, significant, direct, indirect, or not significant way?

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
Potential Impacts of the project include direct, indirect, adverse, beneficial, significant and not significant. This assessment would include all of the potential impacts of the environment, but also include discussions on the direct and indirect impacts associated therewith.	

F. A **discussion of potential cumulative and long-term environmental effects** from the proposed action

The NEPA process requires an analysis of cumulative impacts which is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR§1508.7).

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
This section would include discussions relating to the specific sites cumulative impact as well as impacts to the entire Mojave Desert associated with this project and other projects near or within the region. This could include cumulative impacts to species, the ecosystem, changes in climate (i.e. heat sinks), changes in wind patterns, wildlife migration, access to cultural resources, etc.	

G. A discussion of the degree of controversy on environmental grounds by impact category if controversy is an issue;

This section addresses where a project could be impacted by controversy regarding similar projects. Here is the section to discuss solar energy development in the Mojave Desert generally, as well as the issues associated with these project for Native American Tribes.

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
This section addresses where a project could be impacted by controversy regarding similar projects. Here is the section to discuss solar energy development in the Mojave Desert generally, as well as the issues associated with this project for Native American Tribes.	

H. Mitigation measures when they are intended to reduce impacts to less than significant levels.

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
It is important to clarify that there are differences between the legal definition of “significant levels” for terms if NEPA	

compliance and “significant levels” for Native American Tribes from a cultural continuation perspective.	

I. Public comment schedule and consultation.

This would be where to indicate whether the timing and types of meetings will be sufficient to address communication and consultation desired by Native American Tribes. Some examples of recommendations include:

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
Including discussion of any existing protocols relating to communication or consultation. Other recommendations to consider include: • Scoping meeting between Fort Irwin and Native American Tribes (Energy Initiative Task Force representative should be present or kept informed in the event that decisions would be required to be made by EITF based on meeting discussions); • This meeting may or may not include sharing of **confidential** cultural resource information • Scoping meeting with Third Party Contractor for the Project, or at least an opportunity to review and discuss design and siting details before final decisions are made. • If a third party contractor cannot be determined until final decisions are made with respect to design and siting, Tribes should have an opportunity to review and discuss potential design and siting (based on pending applications) to provide feedback on design and siting with minimal impacts to cultural	

resources; • Review and Discussion of Cultural Monitoring Plan.	

J. Health Impacts.—What are specific and overall health impacts associated with the project.

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
What are the specific and overall health impacts associated with the project? This section should include beneficial impacts as well as adverse impacts.	

II. Formal Government to Government Consultation

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)

Tribes are generally included in a consultation process for federal projects that may impact tribal lands. This project does not require formal tribal consultation; however, the tribes may address the need for specific steps to achieve the benefits of tribal consultation such as developing an informational exchange throughout the project, identification of tribal cultural resources, and providing support for any resources that may be impacted by the project. It is important to suggest a process for holding such meetings. An example of some recommendations to offer include: a. Pairing the informal consultation on this project with other and similar projects being conducted at Fort Irwin. However it is recommended that there is sufficient time in the discussion to review relevant details for each Project. Consultation should be BEFORE final decisions affecting actual siting and design to allow NA Tribes to provide input. b. Distance of cultural resources identified from APE- review of these specifics would require an in person meeting or methods to ensure maintaining confidentiality of sensitive information. c. How in depth have the environmental reviews been on alternate sites where cultural resources were found? (Has a tribal cultural monitor reviewed the findings?)	

III. Historical trauma:

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
a. Are there any specific historical trauma issues that have occurred in the project area or with the project owners that should be noted? b. Does the project increase or decrease the impact of the historic trauma on the tribal community?	

c. Does the project increase or decrease any modern stressors upon the tribal community or administration of the tribal government?	

IV. Tribal Community Recommendations:

Points to consider/Notes for Comments	Recommendations (please provide additional considerations to include here)
Summarize or reiterate specific recommendations particularly mitigation measures with respect to this project.	

APPENDIX C

Mojave Desert Tribal Communities Health Profile

To determine the impacts of policies and projects upon tribal community health, it is important to include impacts upon tribal cultural practices. Tribal culture is an important component of tribal health and wellness. Tribal culture is difficult to define and measure but components of tribal cultural practices may be identified. Tribal culture embodies historic cultural practices as well as modern tribal governance. It includes tribal community values as well as federal laws that protect the legal rights of tribes to create and live under their own system of laws. It also includes the right of tribes to be engaged in consultation with federal and state agencies involved in policies or projects that may impact tribal communities. "History has shown that failure to include the voices of tribal officials in formulating policy affecting their communities has all too often led to undesirable and, at times, devastating and tragic results. By contrast, meaningful dialogue between Federal officials and tribal officials has greatly improved Federal policy toward Indian tribes. Consultation is a critical ingredient of a sound and productive Federal-tribal relationship."[23] Improved federal policies and inclusion of tribal voices and values plays a distinct role in allowing tribes to define and declare their own cultural values.

As reported in the 2010 American Indian and Alaska Native Health Assessment in California, the major determinants of AI/AN health in California are:

1. Sovereignty and Self Determination
2. Cultural Revitalization
3. Access to Culturally Competent and Affordable Health Care

"As tribal communities in California reassert control over their own affairs, they invest in restoration of language, protection of ancestral and ceremonial properties, revitalization of ceremonies and crafts, and the defense of indigenous values and cultural practices."[24] Tribal programs that seek restoration and revitalization of tribal cultural practices serve as baseline evidence of tribal cultural practices. Though difficult to measure and compare, the existence of these programs should be included in the tribal community health profile. Common cultural practices include tribal creation stories, deities, ceremonies, language, and traditional foods, values and practices. Many of the tribal creation stories are based in specific landscapes and include native flora and fauna as primary deities, heroes and tricksters. These elements are often the source of the tribal community's spiritual connection and duty of care for the native environment.

There are fourteen federally recognized tribes that are considered Mojave Desert Tribal Communities that are participating in the Health Impact Assessment of the Fort Irwin Photovoltaic Facility. This Tribal Community Health Baseline Profile identifies current existing cultural programs and statistical measures in other areas of health within the Mojave Desert Tribal Communities, California Tribal Communities,

[23] President Barack Obama, Presidential Memorandum, November 5, 2009.
[24] American Indian and Alaska Native Health Assessment in California, California Rural Indian Health Board (2010), page 37.

Tribal Communities in general, California in general and the U.S. population in general. Contact information for each of the tribes is included in the appendix to this Health Profile. The Mojave Desert Tribal Communities and current cultural programs are as follows:

	Tribe/Cultural Practice	Tribal Language Program	Tribal School or youth serving program (K, K-6)	Tribal School or youth serving programs (7-12)	Historic Preservation Officer (THPO) or Cultural Resources Officer	Tribal Museum	GIS Team/ EPA	Customs and Traditions	Other
1	Big Pine Paiute Tribe of Owens Valley		After school program	After school program through 8th	Yes			Native foods harvesting	
2	Bishop Paiute Tribe	Bishop Indian Education Center	Bishop Indian Education Center Programs	Bishop Indian Education Center Programs	Yes	Owens Valley Paiute-Shoshone Cultural Center & Museum	TEPA Committee	Native foods harvesting; Native plants garden	Cultural Advisory Committee
3	Chemehuevi Indian Tribe	Chemehuevi Cultural Center	Headstart, Education Dpt Tutoring, After school program	Education Department, Tutoring, After school program, GED	Chemehuevi Cultural Center	Chemehuevi Cultural Center	Cultural Resource Conservation and Environmental Programs	Salt Songs Preservation and Salt Song Trails Program	
4	Colorado River Indian Tribes	(waiting for confirmation)	Headstart, Education Dpt. Programs	Education Dpt. Programs	Yes, Ahakhav Tribal Preserve	Museum and Gift Shop	Yes, Environmental Dpt.	Ahakhav Tribal Preserve, Big House/Ceremonial House	
5	Fort	Informal			Yes		Enviro		

	Independence Community of Paiute Indians	language classes					nmental Office		
6	Fort Mojave Indian Tribe	Cultural Workshops, Bird songs Workshop	Child Care, Boys and Girls Club	AHA MACAV Tribal High school, Education Dpt After School, Tutoring Programs			Environmental and GIS Dpts.	Stole Ceremony for youth, Tribal Youth Dance Group	
7	Kaibab Band of Paiute Indians		Early Learning Center, Tutoring	Tutoring	Yes and Wildlife Dpt. program for Cultural Practices, S. Paiute Consortium		Environmental Dpt., S. Paiute Consortium	S. Paiute Consortium	
8	Las Vegas Tribe of Paiute Indians		Child Dev. Center, Education Dpt. Tutoring Services	Education Dpt. Tutoring Services					Annual Pow Wow
9	Lone Pine Paiute Shoshone Tribe				Yes		Environmental Programs		
10	Moapa Band of Paiute Indians		Day Care		Cultural Committee				
11	Morongo Band of Cahuilla Mission Indians	Yes	Tribal School	Tribal School	Awaiting Confirmation	Collection exhibited in Tribal Offices	Environmental Dpt., GIS		Annual Pow Wow
12	San Manuel Band of Serrano Mission Indians	Yes	Education Center	Education Center	Yes			Bird Songs, Dance Program	Annual Pow Wow
1	Timbisha				Tribal		Enviro	Tradition	

3	Shoshone Tribe				Historic Preservation Officer		nmental	al Village, Native Plants - Foods Garden	
14	Twenty-Nine Palms Band of Mission Indians				Yes			Village Oasis, Bird Songs, Dancing	

The Indian Health Service (HIS) is an agency within the Department of Health and Human Services that provides a comprehensive health service delivery system for approximately 2.2 million of the nation's estimated 3.4 million American Indians and Alaska Natives (American Indian and Alaska Native alone; bridged 2000 census). The Mojave Desert Tribal Communities are served by the Indian Health Services offices noted in the table below. While not all tribal members partake in Indian Health Services, it is important to note the proximity of the offices to the tribal communities and the available services in the region in an effort to understand available resources for specific health concerns. It is also important to note that tribal members that live off of tribal lands may also receive Indian Health Services at the following clinics and contribute to the health data provided by Indian Health Services.

Clinic	**Services**	**Service Area (Tribal Lands and non-Tribal Lands)**
Anza Outreach Office 19969 Greenly Road, Suite D Sonora CA 95370	Medical, Dental, Chemical Dependency, Mental Health, Outreach including Patient Escort	Riverside and San Bernadino Counties serving the following tribal communities:
Barstow Indian Health 170 Yucca Ave. Barstow, CA. 92311	Outreach including Patient Escort	29 Palms Reservation Adelanto Agua Caliente Reservation Aguanga Anza Apple Valley Augustine Reservation Banning Barstow Beaumont Big Bear City Big Bear Lake Bloomington Blythe West Cahuilla Reservation Calimesa Cathedral City Cherry Valley Chino Chino Hills Crestline Dagget Desert Hot Springs Fontana
Commodity Warehouse 201 California Ave., Suite B Beaumont CA 92223	Commodity Distribution	
Ft. Mojave Wic Office 500 Meridian Ave. Needles CA 92363	Women, Infants and Children Program	
Morongo Health Clinic 11555 1/2 Potrero Rd Banning CA 92220	Medical, Dental, Eye Care, Mental Health, Chemical Dependency, Pharmacy, Laboratory (Complex), Commodities, Senior Nutrition, Meals on Wheels, Outreach (Includes Patient Escort)	
Palm Springs Outreach 901 E. Tahquitz Way Suite A204 Palm Springs CA 92262	Outreach (Includes Patient Escort), Chemical Dependency	
Pechanga Health Clinic 12784 Pechanga Road Temecula CA 92390	Medical, Mental Health, Chemical Dependency, Outreach (Includes Patient Escort), Senior Nutrition, Meals on Wheels	
San Manuel Health Clinic	Medical, Dental, Eye Care, Mental	

2210 E. Highland Ave. Suite 200 San Bernadino CA 92404	Health, Chemical Dependency, Pharmacy, Laboratory, Outreach (Includes Patient Escort)	Helen Dale Hemet Highland Hinkley Homeland Indio Joshua Tree La Quinta Lake Arrowhead Lake Elsinore Lakeview Loma Linda Lucerne Valley Mentone Mira Loma Mission Creek Montclaire Moreno Valley Morongo Reservation Mountain Center Murrieta Norco Nuevo Ontario Palm Desert Palm Springs Pechanga Perris Ramona Reservation Rancho Cucamonga Redlands Rialto Rialto Riverside Romoland Rubidoux Running Springs San Bernardino San Manuel Reservation Santa Rosa Reservation Soboba Reservation Sun City Temecula Thermal Torres-Martinez Res. Trona Upland Victorville West of Riverside/San Bernadino Wildomar Yermo Yucaipa Yucca Valley
Soboba Health Clinic 607 Donna Way San Jacinto CA 92583 - 5517	Medical, Dental, Eye Care, Mental Health, Chemical Dependency, Outreach, Pharmacy, Laboratory, X-ray	
Torres-Martinez Indian Health Clinic 66-735 Martinez Road Thermal CA 92274	Medical, Dental, Mental Health, Chemical Dependency, Outreach (Includes Patient Escort), Pharmacy, Laboratory, X-ray	
Tuscany Suite Diabetes/Native Challenge 514 California Ave. Beaumont CA 92223	Diabetes Treatment and Prevention	
		Inyo and Mono Counties
Toiyabe Indian Health Project, Inc.	Ambulatory Rural Primary Care (Medical, pharmacy, dental,	Benton Benton-Paiute Res.

(Bishop) 52 TuSu Lane Bishop CA 93514 - 8058	community health, Elders, WIC, preventative medicine, family services, dialysis center, optical)	Big Pine Big Pine Res Bishop Bishop Res.. Bridgeport Bridgeport Res. Coleville Darwin Death Valley Ft. Independence June Lake Keeler Lee Vining Lone Pine Lone Pine Resv. Mammoth Neval Area Nevhop Area Nevkern Area Olancha
Coleville Clinic 73 Camp Antelope Road Coleville CA 96107 - 9710	Just opened - Medical, Dental, Behavioral Health, Outreach Services	
Lone Pine Clinic 1150 S. Goodwin Lane Lone Pine CA 93545 - 3005	Ambulatory Rural Primary Care	

The scope of services provided by California Indian Health Services clinics is comprehensive in certain areas. Some clinics are limited in what they provide and tribal members are often faced with some distance to travel for specific or specialized care. At the IHS – Tribal consultation with California tribes, California Tribal Leaders established the following five health priorities to be addressed by the 2016 IHS budget: (1) Contract Health Services; (2) Diabetes/Obesity; (3) Behavioral Health; (4) Dental Health; and (5) Methamphetamine and Suicide Prevention/Domestic Violence Prevention.[25] In 2010, the Centers for Disease Control and Injury Prevention cited the top 10 leading causes of death among American Indians/Alaska Natives. In contrast with the priorities set by California Tribal Leaders, the CDC ranked diabetes as the fourth leading cause of death nationally and suicide prevention as the eighth leading cause of death nationally.

The health data below has been summarized from the following sources:

1. American Indian and Alaska Native Health Assessment in California, California Rural Indian Health Board (2010)
2. Indian Health Service (HIS) Year 2014 Profile (based on 2000 – 2013 data)
3. Indian Health Disparities Fact Sheet (based on 2006 – 2008 data)
4. A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles
5. 2010 Tribal Public Health Profile, Exploring Public Health Capacity in Indian Country, National Indian Health Board
6. National Congress of American Indians Tribal Health Care Implementation Initiative Site, and
7. Indian Health Service's Trends in Indian Health 1998 – 1999.

[25] California Area Indian Health Service Tribal Consultation, Resources for Tribal Leaders, Budget Formulation.PDF, http://www.ihs.gov/california/index.cfm/tribal-consultation/resources-for-tribal-leaders/presentations-from-the-2014-tribal-leaders-meeting/

Health Concern	Mojave Desert Tribes	California Tribes (Adults 18 – 64)	California Tribal Elders (55 - 64)	California Generally
General Health				
Fair or Poor Health	14.4% Fair[26] 31.3% Poor[27]	25.6% of AI/AN adults are estimated to have fair or poor overall health.[28]		19.4% of CA adults are estimated to have fair or poor overall health.[29]
Life Expectancy				
Male		67.5 years[30]		74.0 years for Caucasian men in the same counties.[31]
Female		75.1 years[32]		78.2 years for Caucasian women in the same counties.[33]
Chronic Health Problems				
Obesity		36.2% of AI/AN adults are estimated to be obese.[34]	43.6%[35]	24.8% of CA adults are estimated to be obese.[36]
Diabetes	100%[37]	13.9% of AI/AN adults are estimated to have diabetes.[38]	25.6%[39]	8.4% of CA adults are estimated to have diabetes.[40]
High Blood Pressure	56.7%[41]	43.4% of AI/AN adults have been diagnosed with		27.3% of CA adults have been diagnosed with

[26] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[27] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[28] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 4.
[29] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 4.
[30] American Indian and Alaska Native Health Assessment in California (2010), page 32.
[31] American Indian and Alaska Native Health Assessment in California (2010), page 32.
[32] American Indian and Alaska Native Health Assessment in California (2010), page 32.
[33] American Indian and Alaska Native Health Assessment in California (2010), page 32.
[34] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 4.
[35] Health of American Indian and Alaska Native Elders in California, Satter, Wallace, Garcia and Smith, (2010), page 5.
[36] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 4.
[37] (Unstable data warning) UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[38] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 4.
[39] Health of American Indian and Alaska Native Elders in California, Satter, Wallace, Garcia and Smith, (2010), page 11.
[40] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 4.
[41] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.

		high blood pressure.[42]		high blood pressure.[43]
Current Asthma		23.4% of AI/AN adults have a current diagnosis of asthma.[44]	20%[45]	7.7% of CA adults have a current diagnosis of asthma.[46]
Serious Psychological Distress	18.3%[47]	10.6% of AI/AN adults have had serious psychological distress in the past year.[48]		7.9% of CA adults have had serious psychological distress in the past year.[49]
Heart Disease	7.2%[50]	7%[51]	20.9%[52]	8%[53]
Stroke	0.0%[54]			
Cancer			9.8%[55]	
STDs				
Health Behaviors				
Cigarette Smoking	15%[56]	28.7% of AI/AN adults are current smokers.[57]	17.8%[58]	13.8% of CA adults are current smokers.[59]
Binge Drinking	24.4%[60]	29.6% of AI/AN adults reported binge drinking.[61]	27%[62]	31.1% of CA reported binge drinking.[63]
Regular Walking	67%[64]	35% of AI/AN		33.3% of CA

[42] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 4.
[43] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 4.
[44] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[45] Health of American Indian and Alaska Native Elders in California, Satter, Wallace, Garcia and Smith, (2010), page 13.
[46] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[47] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[48] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[49] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[50] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[51] California American Indian Community Health Profile, California Tribal Epidemiology Center, (2009), page 18.
[52] Health of American Indian and Alaska Native Elders in California, Satter, Wallace, Garcia and Smith, (2010), page 12.
[53] California American Indian Community Health Profile, California Tribal Epidemiology Center, (2009), page 18.
[54] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[55] Health of American Indian and Alaska Native Elders in California, Satter, Wallace, Garcia and Smith, (2010), page 15.
[56] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[57] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[58] Health of American Indian and Alaska Native Elders in California, Satter, Wallace, Garcia and Smith, (2010), page 9.
[59] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[60] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[61] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[62] Health of American Indian and Alaska Native Elders in California, Satter, Wallace, Garcia and Smith, (2010), page 7.
[63] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[64] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.

during the past week		adults reported regular walking during the past week.[65]		Adults reported regular walking during the past week.[66]
Consumed Fruits and Vegetables 3 or more times in the past day		27.2% of AI/AN adults reported consuming 3 or more fruits and vegetables in the past day.[67]		27.2% of CA adults reported consuming 3 or more fruits and vegetables in the past day.[68]
Falls (more than once in past year)			22.3%[69]	
Demographics				
Population		AI/AN make up 0.4% of the CA Population[70]		
Employment				
Income Levels	100% have an income of 0 to $50,000[71]	40.6% of adult AI/AN in California had an income below 200% of the Federal Poverty Level[72]		
Health Insurance	50.4%[73] are uninsured	24% of AI/AN adults in CA report having no health insurance for the past year.[74]		26% of adults in CA report having no health insurance for the past year.[75]
Medi-Cal Enrollment	23.7% enrolled in Medi-Cal[76]	18.5% of AI/AN adults were estimated to be enrolled in Medi-Cal for the past year.[77]		11.6% of adults in CA were estimated to be enrolled in Medi-Cal for the past year.[78]

[65] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[66] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[67] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[68] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 7.
[69] Health of American Indian and Alaska Native Elders in California, Satter, Wallace, Garcia and Smith, (2010), page 17.
[70] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 1.
[71] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[72] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 1.
[73] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[74] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 2.
[75] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 2.
[76] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[77] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 2.
[78] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 2.

Employment Based Insurance	26.0%[79]	42.4% of AI/AN adults were estimated to employment based insurance for the past year.[80]		50.6% of adults were estimated to employment based insurance for the past year.[81]
No Usual Source of Health Care		9.7% of AI/AN adults were estimated to have no usual source of health care when in need of health care or advice.[82]		17.6% of adults were estimated to have no usual source of health care when in need of health care or advice.[83]
Delayed in getting prescription drugs or medical services in the past year		29% of AI/AN adults were estimated to have delayed in getting prescription drugs or medical services in the past year.[84]		21.5% of adults were estimated to have delayed in getting prescription drugs or medical services in the past year.[85]
Food Insecurity		18.4% of AI/AN adults had difficulty putting food on the table in the past year.[86]	41%[87]	14.9% of AI/AN adults had difficulty putting food on the table in the past year.[88]

[79] UCLA Center for Health Policy Research, AskCHIS, AI/AN data by county. http://ask.chis.ucla.edu.
[80] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 2.
[81] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 2.
[82] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 3.
[83] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 3.
[84] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 2.
[85] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 2.
[86] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 2.
[87] Health of American Indian and Alaska Native Elders in California, Satter, Wallace, Garcia and Smith, (2010), page 6.
[88] A Health Profile of California's Diverse Population, 2011-2012 Race/Ethnicity Health Profiles, page 2.

Mojave Desert Tribes Contact List

Tribe	Name	Position	Phone	Email
Big Pine Paiute Tribe of Owens Valley	Mr. Bill Helmer	Tribal Preservation Officer	(760) 938-2003 ext 228	b.helmer@bigpinepaiute.org
Bishop Paiute Tribe	Raymond Andrews	Tribal Historic Preservation Officer	(760) 873-3584	raymond.andrews@bishoppaiute.org
Chemehuevi Indian Tribe	Ron Escobar	Secretary Treasurer for Tribe	(760) 858-4301	ronetribe@yahoo.com
Chemehuevi Indian Tribe	Steven Escobar	EPA	(760)858-1140	chem.waterquality@gmail.com
Colorado River Indian Tribes	Wilene Fisher-Holt	Cultural Resources	(928) 669-9211 Fax: 928-669-1925	Wilene.Fisher-Holt@crit-nsn.gov
Colorado River Indian Tribe	Josephina Rivera	EPA assistant		Josephina.rivera@crit-nsn.gov
Fort Independence Community of Paiute Indians	C. Fazio Priscilla Naylor	EPA Director THPO	(760) 878-5160 (760) 878-5160	c.fazio48@gmail.com
Fort Mojave Indian Tribe	Nora McDowell	Assistant to Linda Otero	(928)768-4475	noramcdowell@fortmojave.com
Fort Mojave Indian Tribe	Linda Otero		(928) 768-4475	LindaOtero@FortMojave.com
Kaibab Band of Paiute Indians	Charley Bullets	Cultural Resources	Tribal Officer (928) 643-7245 Mr. Bullets # (928) 643-6278	cbullets@kaibabpaiute-nsn.gov
Las Vegas Tribe of Paiute Indians	Benny Tso	Chairperson	(702) 386-3926	
Lone Pine Paiute Shoshone Tribe	Mel Joseph Kathy Bankcroft	Chairperson THPO	(760) 876-4690 (406) 570-5289	Mel.joseph@lppsr.org kathybncrft@yahoo.com
Moapa Band of Paiute Indians	Randal Simmons	Tribal Administrator	(702) 865-2787	
Morongo Band of Cahuilla Mission Indians				
San Manuel Band of Serrano Mission Indians	Ann Brierty Ken Shoji	Cultural Management Office Public Affairs	(909) 864-8933 ext 3250	abriety@sanmanuel-nsn.gov

				kshoji@sanmanuel.com
Timbisha Shoshone Tribe				
Twenty-nine palms Band of Mission Indians	Anthony Madrigal		(760) 775-5566	amadrigal@29palmsbomi-nsn.gov


SMITH RIVER
ELK VALLEY
KARUK
Crescent City
Del Norte
Siskiyou
Yreka
FT. BIDWELL
XL RANCH
Modoc
QUARTZ VALLEY
RESIGHINI
ALTURAS
CEDARVILLE
YUROK
Weed
Dunsmuir
LOOKOUT
LIKELY
BIG LAGOON
TRINIDAD
HOOPA VALLEY
BIG BEND
ROARING CREEK
Eureka
BLUE LAKE
Trinity
Shasta
Weaverville
MONTGOMERY CREEK
TABLE BLUFF
ROHNERVILLE
REDDING
Lassen
SUSANVILLE
Humboldt
Garberville
Westwood
Red Bluff
GREENVILLE
Tehama
Plumas
Leggett
Quincy
ROUND VALLEY
Mendocino
GRINDSTONE CREEK
Chico
Butte
Portola
LAYTONVILLE
ENTERPRISE
Sierra
SHERWOOD VALLEY
Oroville
BERRY CREEK
MOORETOWN
REDWOOD VALLEY
Yuba
Nevada
Truckee
POTTER VALLEY
Grass Valley
COYOTE VALLEY
Placer
Tahoe City
PINOLEVILLE
Sutter
El Dorado
South Lake Tahoe
HOPLAND
MANCHESTER
Lake
CLOVERDALE
WOODFORD COLONY
Sonoma
DRY CREEK
SHINGLE SPRINGS
Alpine
STEWARTS POINT
Yolo
Sacramento
Amador
JACKSON
Napa
BUENA VISTA
BRIDGEPORT
Santa Rosa
SHEEP RANCH
Calaveras
Vallejo
Solano
Tuolumne
Sonora
TUOLUMNE
Stockton
Mono
Berkley
Contra Costa
San Joaquin
CHICKEN RANCH
BENTON PAIUTE
Oakland
San Francisco
Yosemite Village
Alameda
Modesto
Mariposa
BISHOP
Stanislaus
San Mateo
San Jose
Santa Clara
BIG PINE
Merced
NORTH FORK
PICAYUNE
Madera
BIG SANDY
Santa Cruz
Gilroy
Los Banos
TABLE MOUNTAIN
COLD SPRINGS
FORT INDEPENDENCE
Inyo
Monterey
Salinas
Fresno
Lone Pine
San Benito
Giant Forest
LONE PINE
Death Valley Junction
Hanford
SANTA ROSA
DEATH VALLEY
TIMBA-SHA SHOSHONE
King City
Tulare
Monterey
Coalinga
Kings
TULE RIVER
Lucia
San Simeon
Morro Bay
Paso Robles
Bakersfield
Baker
San Luis Obispo
San Luis Obispo
Kern
Santa Maria
Santa Barbara
Mojave
Barstow
San Bernardino
FORT MOJAVE
Needles
SANTA YNEZ
CHEMEHUEVI
Ventura
Santa Barbara
Los Angeles
SAN MANUEL
TWENTY-NINE PALMS
Glendale
San Bernadino
COLORADO RIVER
Los Angeles
Riverside
MORONGO
Santa Monica
Riverside
AQUA CALIENTE
Santa Ana
Long Beach
Orange
Blythe
TORRES-MARTINEZ
PALA
LOS COYOTES
Imperial
San Diego
FORT YUMA
Calexico
Additional Northern California Indian Lands
A- BIG VALLEY
B- COLUSA
C- CORTINA
D- MIDDLETOWN
E- ROBINSON
F- RUMSEY
G- SULPHUR BANK
H- UPPER LAKE
Additional Southern California Indian Lands
1- AUGUSTINE
2- BARONA
3- CABAZONE
4- CAHUILLA
5- CAMPO (SYCAMORE VALLEY)
6- CAPTAIN GRANDE
7- CUYAPAIPE
8- JAMUL INDIAN VILLAGE
9- INAJA-COSMIT
10- LA JOLLA
11- LA POSTA
12- MANZANITA
13- MESA GRANDE
14- PAUMA & YUIMA
15- PECHANGA
16- RAMONA
17- RINCON
18- SAN PASQUAL
19- SANTA ROSA
20- SOBOBA
21- SAN YSABEL
22- SYCUAN
23- VIEJA