Thank you for your comment, John Crow.

The comment tracking number that has been assigned to your comment is SolarD11747.

Comment Date: April 21, 2011 15:15:42PM
Solar Energy Development PEIS
Comment ID: SolarD11747

First Name: John
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Last Name: Crow
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City: San Diego
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Attachment: DoD Solar PEIS Comments-1 Apr 20 2011.docx

Comment Submitted:

As a Cooperating Agency, per the Memorandum of Agreement dated 8 July, 2009, these three attachments represent the DoD Regional Environmental Coordinator Region 9 installation-coordinated comments for the Solar Energy Development Draft Programmatic Environmental Impact Statement for solar energy development in the six southwestern state area. These comments were routed to and reviewed by the newly established DoD Energy Siting Clearinghouse in Washington, DC.

Please see the attached three files:
1. DoD Solar PEIS Comments-1 Apr 20 2011.
2. DoD Solar PEIS Comments-2 Apr 20 2011.
3. DoD Solar PEIS Comments-3 Apr 20 2011.

Thank you for the opportunity to review and comment on this important document. These comments were also submitted via email to Ms. Resseguie.
Submitted on behalf of DeEllen M. Brasher.

Standard Review Form
Preliminary Draft Solar Energy Development PEIS

Reviewer's Name: DeEllen Brasher
Reviewer's Organization: DoD Regional Environmental Coordinator Region 9
Reviewer's email address: deellen.brasher@navy.mil
Reviewer's Telephone numbers: (619) 532-2434

Primary Disciplinary Area (e.g., ecology, land use planning, regulatory oversight): Impacts to DoD

Section or Chapter Number and Date of Reviewed Document: Reviewed 20 April 11, Executive Summary

EIS Chap	Section/Line	Comment/Suggested Revision	Action *(for use by ANL)*
	General Comments	It is DoD's understanding that the proposed action in this Solar Energy Development PEIS is to develop and implement a new Solar Energy Program that would facilitate environmentally responsible utility-scale solar energy development by establishing environmental policies and design features (i.e., mitigation requirements) related to utility-scale solar energy development in six western states (Arizona, California, Colorado, New Mexico, Nevada, and Utah). Within these six states, the BLM has identified 24 proposed solar energy zones (SEZs) as areas where the BLM would prioritize development. Comments received from various installations addressing these areas have identified several impacts.	
		EXECUTIVE SUMMARY	
Exec Summary	General Comments	Since the DoD has analyzed these 24-study areas, we request that BLM and DOE limit the Solar PEIS to 22 of these 24 SEZs by eliminating the two areas: Delmar Valley and Dry Lake Valley North.	
		Development in several of the 22 remaining areas could have mission impacts to military readiness and would need to be reviewed on a case-by-case basis.	
		The attached DoD comments provide specifics as to the study area impacts and DoD's recommendation. Please see attached documents: DoD Solar PEIS Comments-2 Apr 20 2011, and DoD Solar PEIS Comments-3 Apr 20 2011.	

Thank you for your comment, John Crow.

The comment tracking number that has been assigned to your comment is SolarD11748.

Comment Date: April 21, 2011 15:18:16PM
Solar Energy Development PEIS
Comment ID: SolarD11748

First Name: John
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Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: DoD Solar PEIS Comments-2 Apr 20 2011.docx

Comment Submitted:

As a Cooperating Agency, per the Memorandum of Agreement dated 8 July, 2009, these three attachments represent the DoD Regional Environmental Coordinator Region 9 installation-coordinated comments for the Solar Energy Development Draft Programmatic Environmental Impact Statement for solar energy development in the six southwestern state area. These comments were routed to and reviewed by the newly established DoD Energy Siting Clearinghouse in Washington, DC.

Please see the attached three files:
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Thank you for the opportunity to review and comment on this important document. These comments were also submitted via email to Ms. Resseguie.
Submitted on behalf of DeEllen M. Brasher.

Standard Review Form
Preliminary Draft Solar Energy Development PEIS

Reviewer's Name: Deborah MacNeill **Reviewer's Organization**: 99 ABW/CCY

Reviewer's email address: Deborah.MacNeill@nellis.af.mil **Reviewer's Telephone numbers**: 702 652-7777/3488

Primary Disciplinary Area (e.g., ecology, land use planning, regulatory oversight): Impacts to DoD

Section or Chapter Number and Date of Reviewed Document: Reviewed 16 Feb 11
Executive Summary
Chap 11.1 Amargosa Valley
Chap 11.2 Delamar Valley (Student Gap)
Chap 11.3 Dry Lake
Chap 11.4 Dry Lake (Texas Lake) Valley North
Chap 11.5 East Mormon Mountain
Chap 11.6 Gold Point
Chap 11.7 Miller

EIS Chap	Section/Line	Comment/Suggested Revision	Action *(for use by ANL)*
	General Comments	The Nevada Test and Training Range (NTTR) represents 40% of the Air Force's (AF) land assets, 10% of Department of Defense's (DoD) land assets, and is an irreplaceable national security asset. The NTTR supports every aircraft type in the DoD inventory. Joint and allied partners conduct several highly specialized flying and ground combat testing and training missions on the NTTR in preparation for real-world joint combat operations worldwide. The NTTR is a pristine military testing and training laboratory built on 70 years of scientific research supporting military intelligence, arms, and radar advancement through the investment of an incalculable sum of	

		federal funding. The training and testing environment provided by the NTTR cannot be replicated. Any development in the Upper Dry Lake (Texas Lake) Valley North SEZ or Delamar Valley (Student Gap) SEZ will have an immediate adverse impact to current and future DoD operations on the NTTR. Additionally, any development in these areas will have significant adverse mission impacts to military readiness (detailed below). As a result of the cumulative impacts, we request the proposed Delamar Valley (Student Gap) and Dry Lake (Texas Lake) Valley North sites be removed from consideration as solar development zones. MISSION IMPACTS: 1) For decades, the Federal Aviation Administration (FAA) has authorized a Military Operations Area in the Dry Lake (Texas Lake) Valley North and Delamar Valley (Student Gap) region with an operating floor of 100 feet Above Ground Level (AGL). Nellis Air Force Base (NAFB) currently conducts approximately 50,000 tactical over-flights per year in these areas, which would increase to an estimated 63,000 flights following the beddown of F-35 Joint Strike Fighter aircraft on NAFB should the AF reach a Record of decision on this proposal. Air Force regulations require pilots to avoid structures by 500 feet, so any technology rising above ground level (including PV arrays) will place new and/or further restrictions on military operations. In addition, associated power lines further impact military flight operations by increasing the operating floor from the current altitude of 100 feet to altitudes exceeding 700 feet AGL over the 14,000 acres of proposed SEZ land, as well as surrounding areas. 2) The proposed solar areas are on highly-utilized dry lake beds	

		in valleys critical to military operations. The dry lake beds are approved by the FAA for supersonic operations at 5,000 feet AGL and above. As such, these areas are highly susceptible to sonic booms and associated overpressures. The potential for and magnitude of damage that could result from approved supersonic flight activity may significantly impact the grid and network reliability. 3) The United States Air Force Weapons School, the Air Force's premier tactical training school, regularly utilizes the Delamar Valley (Student Gap) dry lake bed for austere A-10 and C-130 aircraft landing training operations. Exercising landings and departures from austere, unimproved surfaces is critical to aircrews preparing for real-world global combat and contingency operations. The airspace directly above Delamar Valley (Student Gap) provides critical air refueling tracks supporting all military aircraft operating in the eastern sector of the NTTR. The location and availability of tactical air refueling tracks in the specified airspace is vital to flight safety and air traffic management. 4) At this time, it is unknown whether the proposed solar zones will impact other future ground-based training operations in these areas. 5) Radar Frequencies/Electromagnetic Interference (RF/EMI): Radar and radar jamming operations conducted by unique ground-based systems on the NTTR are incompatible with certain types of renewable energy technology. Notably, technologies requiring structures higher than 50 feet AGL present unacceptable electromagnetic compatibility and flight safety concerns on the NTTR. 6) Transmission lines: The demand for multiple, interconnected transmission lines to transport power from proposed SEZs to demand centers/marketplace may negatively impact airspace through increased altitude restrictions in low-level flight	

		corridors and MOAs. Transmission lines (individually or through a cumulative effect) may create restrictions that adversely impact military testing and training capabilities on the NTTR. **7)** Thermal boundaries: Certain solar technologies release or emit extreme heat near and/or above their development. The extreme heat may create a thermal boundary that requires aircraft to avoid the area in order to prevent aircraft buffeting, damage, or accidents. Further, heat-sensitive armament may create a severe safety hazard for aircrew and ground-based personnel in the area. 8) Glare: Depending on technology design features built at all proposed SEZs, reflective glare may create a severe safety hazard to pilots and aircraft, (including major force exercises such as RED FLAG and Weapons School Mission Employment Phase). 9) Infrared targeting systems: Based on design specifications of concentrated solar towers, the heat being radiated by solar collectors at the top of the towers overlaps the same infra-red spectrum used by multiple DoD aircraft and weapon sensors during both test and training missions. Scientific analysis indicates that this spectrum overlap will cause unacceptable sensor degradation of systems as a function of the distance from solar towers. 10) Cameras/security: Many solar technologies require the use of cameras for the targeting of mirrors on solar collectors. The use of high definition camera equipment on the NTTR presents a security concern for joint and allied aircraft test and training operations. 11) Wireless systems: Electronic jamming on the NTTR is conducted on a regular basis. It is unknown how military operations could impact wirelessly controlled mirrors, or how disturbing mirror alignment could create a glare hazard to flight	

		crews or navigation. DoD assesses that development in the Delamar Valley (Student Gap) and Dry Lake (Texas Lake) Valley North SEZs would create significant adverse impacts to military testing and training missions in the area. For reasons of safety and unacceptable mission impacts to joint and allied military operations, it is requested that both zones be removed from consideration as SEZs.	
		EXECUTIVE SUMMARY	
Exec Summary	ES.2.3.1 *ES-7* *Lines 5-6, 13*	**COMMENT:** ***Nevada RE Goals (per Energy Policy Act of 2005 and Secretarial Order 3285A1) can be met without designating the Delamar Valley (Student Gap) and Dry Lake (Texas Lake) North locations as BLM SEZs.*** According to the BLM Preferred Alternative, approximately 9.5 million acres of BLM-administered land in Nevada would be available for ROW based on exclusions outlined. Further, SEZ lands would total more than 171,000 acres. According to table ES.2-3, total acreage proposed for the Delamar Valley (Student Gap) and Dry Lake (Texas Lake) North locations is 93,426 acres. If excluded, 9.4 million acres of BLM land would remain available for ROW, including 77,500 acres designated as SEZ areas with a lesser impact to military operations. In addition to power generated by private RE projects and those already authorized on BLM land in NV, the remaining 77,500 acres of BLM-administered SEZ land would be more than sufficient to meet current and future NV RE goals.	
Exec Summary & Appendix A	Required Elements of BLM's Proposed Solar Energy Program *ES-11*	Reference Appendix A, Section A.2.2, Table A.2-1 "Mitigation Plans Specified as Elements of proposed Design Features": Request the following be added in effort to mitigate adverse impacts to military operations: -- Wireless Systems/Electrical Frequency Assessment, Mitigation and Monitoring Plan -- Security (or Security System) Plan	

	Appendix A, Section A.2.2	-- Heat emissions Assessment, Mitigation and Monitoring Plan ***OR provide an all-encompassing:*** -- Military Operations Compatibility Assessment, Mitigation and Monitoring Plan.	
Exec Summary	*ES-14* Line 42-46	The comment stating that cumulative effects would be low is inaccurate, (pending revision of design feature policies requiring that impacts to military operations be mitigated.)	
Exec Summary	Table ES.2-2	Recommend the following be added to Table ES.2-2: "Areas for Exclusion under the BLM Solar Energy Development Program Alternative." -- Areas where solar energy development proposals are assessed by the DoD and partner agencies as having significant adverse impacts to military operations.	
Exec Summary	Table ES.2-5	Recommend the following be added to Table ES.2-5: "Summary-Level Assessment of Potential Environmental Impacts by Alternative." - *Military and Civilian Aviation* -- Development of solar energy facilities and associated infrastructure in specific areas would result in significant impacts to military operations, potentially degrading testing and training operations supporting the national security mission. Military and civilian aviation impacts would be identified and adequately mitigated prior to BLM's issuance of a ROW authorization.	
11.1		**AMARGOSA VALLEY SEZ**	
11.1.6 *Military and Civilian Aviation*	Table 11.1.1.3-1	Recommend the following revision to Table 11.1.1.3-1: "Summary of Impacts of Solar Energy Development within the Proposed Amargosa Valley SEZ and SEZ-Specific Design Features": *Military and Civilian Aviation:* -- The military has expressed serious concern over certain solar energy technologies being constructed within the Amargosa Valley SEZ. DoD has indicated that any facilities exceeding 50 feet (15 m) in height may be incompatible with low-level aircraft operations conducted in approved Military Training Routes (MTR). Additionally, glare and heat emissions produced by certain types of technology	

		may present both flight and ground safety concerns. Further, DoD has indicated that solar technologies requiring structures higher than 50 feet (15 m) AGL may present unacceptable electromagnetic compatibility concerns for certain test and training missions. **NOTE:** MTR airspace is authorized and utilized from the surface to 9,400 feet mean sea level (MSL). The proposed SEZ development encompasses the entire route.	
11.1.6 *Military and Civ Aviation*	11.1.6.2 *Impacts* Line 21	Recommend adding the following: …. "Additionally, glare and heat emissions produced by certain types of technology may present both flight and ground safety concerns. Further,…"	
11.1.15 *Acoustic Environment*	11.1.15.1 *Affected Environment* Line 17	Recommend adding the following: … "Additionally, several approved, highly-utilized military training routes (MTRs) exist in airspace directly above the SEZ."	
11.1.15 *Acoustic Environment*	11.1.15.1 *Affected Environment* Line 30	Recommend adding the following: … "Noise levels may be impacted by routine military flight operations occurring in military training routes (MTRs) located directly above and proximal to the SEZ…."	
11.2		**DELAMAR VALLEY SEZ (STUDENT GAP)**	
11.2.1.1 *General Information*	11.2.1.1 *General Information* Line 35	Recommend adding the following: …. "Airspace directly above and proximal to the proposed Delamar Valley (Student Gap) SEZ is categorized as an approved military operations area (MOA), which is routinely utilized for supersonic military flight operations authorized at and above 5,000 feet AGL (1,524 m)." **NOTE:** The proposed SEZ is located below a desert MOA with airspace authorized and utilized from 100 feet AGL to unlimited. An authorized and utilized supersonic flight area exists 5,000 feet AGL above this SEZ.	

		As a result of the cumulative impacts, we request the proposed Delamar Valley (Student Gap) site be removed from consideration as a solar development zone.	
11.2.1.3 *Summary of Major Impacts*	Table 11.2.1.3-1	Recommend the following revision to Table 11.2.1.3-1 "Summary of Impacts of Solar Energy Development within the Proposed Delamar Valley (Student Gap) SEZ and SEZ-Specific Design Features": *Military and Civilian Aviation* -- The military has expressed serious concern over construction of solar energy facilities within the SEZ. DoD has indicated that facilities exceeding 50 feet in height may be incompatible with low-level aircraft use of the MTR. Additionally, supersonic military flight operations are authorized at and above 5,000 feet AGL (1,524 m) in airspace directly above and proximal to the SEZ. Noise and overpressure impacts resulting from supersonic flight may adversely impact solar technology or infrastructure in the SEZ. Also, solar technology possessing reflectivity characteristics may create severe glint and glare hazards for aircrew operating in approved airspace. Further, DoD has indicated that solar technologies requiring structures higher than 50 feet (15 m) above ground level may present unacceptable electromagnetic compatibility concerns for their test mission. As a result of the cumulative impacts, we request the proposed Delamar Valley (Student Gap) site be removed from consideration as a solar development zone.	
11.2.6 *Military and Civilian Aviation*	11.2.6.2 *Impacts*	Recommend adding the following: -- Further, noise and overpressure impacts resulting from supersonic flight may adversely impact solar technology or infrastructure in the SEZ. As a result of the cumulative impacts, we request the proposed Delamar Valley (Student Gap) site be removed from consideration as a solar development zone.	

11.2.15 *Acoustic Environment*	11.2.15.1 *Affected Environment* Line 16/26	Recommend adding the following: … "Supersonic flight operations conducted at and above 5,000 AGL in military airspace above and proximal to the SEZ may produce significant noise and subsequent overpressure concerns…." As a result of the cumulative impacts, we request the proposed Delamar Valley (Student Gap) site be removed from consideration as a solar development zone.	
11.3		**DRY LAKE SEZ**	
11.3.1 *Background and Summary of Impacts*	11.3.1.1 *General Information* Line 21	This SEZ is directly under the primary route used by military aircraft to enter and exit the NTTR from Nellis Air Force Base. Recommend adding the following: -- "Nellis Air Force Base, located to the southwest, maintains a major military airfield from which nearly 50,000 DoD and allied aircraft departures and arrivals occur annually." **NOTE:** Per Nellis Air Force Base Air Force Instruction (AFI) 11-250 para 6.13, Controlled Bailout Procedures, the primary controlled bailout location is Dry Lake (LSV 015/15). "Should it become necessary to use this area in an emergency situation, aircraft proceed to Dry Lake at an altitude of 15,000 feet MSL, (8,000 feet MSL for non-ejection seat equipped aircraft), turn to a heading of 345, and eject or bailout." Solar development in this area would present a severe safety risk for aircrew in emergency situations, as well as present potential liability for excessive damage to technology and surrounding infrastructure. Additionally, terminal procedures for approaches and departures from runways at Nellis Air Force Base will be adversely impacted by solar towers or other tall structures built in the proposed Dry Lake SEZ area. The Dry Lake SEZ area is located within the navigational aid flight path for approaching aircraft. Obstacles in this area are highly	

		incompatible with flight operations, and may present severe safety concerns. Maintaining an open, unpopulated area close to the Nellis Air Force Base runways for controlled bailout purposes is critical to the safety of military pilots and the community. Therefore, we recommend a reduction in size of the Dry Lake SEZ to ensure a flat, non-developed area remains available for emergency aircraft bailout purposes.	
11.3.1.3-1 *Summary of Major Impacts*	Table 11.3.1.3-1	Recommend the following revision to Table 11.3.1.3-1 "Summary of Impacts of Solar Energy Development within the Proposed Dry Lake SEZ and SEZ-Specific Design Features" : *Military and Civilian Aviation* - DoD has expressed concern for solar energy facilities that might affect approach and departure from runways on the base. The military is also concerned with the potential impact on the test and training mission at the NTTR. **NOTE:** Per Nellis Air Force Base Air Force Instruction (AFI) 11-250 para 6.13, Controlled Bailout Procedures, the primary controlled bailout location is Dry Lake (LSV 015/15). "Should it become necessary to use this area in an emergency situation, aircraft proceed to Dry Lake at an altitude of 15,000 feet MSL, (8,000 feet MSL for non-ejection seat equipped aircraft), turn to a heading of 345, and eject or bailout." Solar development in this area would present a severe safety risk for aircrew in emergency situations, as well as present potential liability for excessive damage to technology and surrounding infrastructure. Additionally, terminal procedures for approaches and departures from runways at Nellis Air Force Base will be adversely impacted by solar towers or other tall structures built in the proposed Dry Lake SEZ area. The Dry Lake SEZ area is located within the navigational aid flight path for approaching aircraft. Obstacles in this area are highly incompatible with flight operations, and may present severe safety concerns. Maintaining an open, unpopulated area close to the Nellis	

		Air Force Base runways for controlled bailout purposes is critical to the safety of military pilots and the community. As a result of the cumulative impacts, we recommend a reduction in size of the Dry Lake SEZ to ensure a flat, non-developed area remains available for emergency aircraft bailout purposes.	
11.3.6 *Military and Civilian Aviation*	11.3.6.2 *Impacts* Line 21	Recommend adding the following: - DoD has expressed concern for solar energy facilities that might affect approach and departure from runways on the base. The military is also concerned with the potential impact on the test and training mission at the NTTR. **NOTE:** Per Nellis Air Force Base Air Force Instruction (AFI) 11-250 para 6.13, Controlled Bailout Procedures, the primary controlled bailout location is Dry Lake (LSV 015/15). "Should it become necessary to use this area in an emergency situation, aircraft proceed to Dry Lake at an altitude of 15,000 feet MSL, (8,000 feet MSL for non-ejection seat equipped aircraft), turn to a heading of 345, and eject or bailout." Solar development in this area would present a severe safety risk for aircrew in emergency situations, as well as present potential liability for excessive damage to technology and surrounding infrastructure. Additionally, terminal procedures for approaches and departures from runways at Nellis Air Force Base will be adversely impacted by solar towers or other tall structures built in the proposed Dry Lake SEZ area. The Dry Lake SEZ area is located within the navigational aid flight path for approaching aircraft. Obstacles in this area are highly incompatible with flight operations, and may present severe safety concerns. Maintaining an open, unpopulated area close to the Nellis Air Force Base runways for controlled bailout purposes is critical to the safety of military pilots and the community.	

		As a result of the cumulative impacts, we recommend a reduction in size of the Dry Lake SEZ to ensure a flat, non-developed area remains available for emergency aircraft bailout purposes.	
11.4		**UPPER DRY LAKE (TEXAS LAKE) VALLEY NORTH SEZ**	
11.4.1 *Background and Summary of Impacts*	11.4.1.1 *General Information* Line 22	Recommend adding the following: …. "Airspace directly above and proximal to the proposed Upper Dry Lake (Texas Lake) Valley North SEZ is categorized as an approved military operations area (MOA), which is routinely utilized for supersonic military flight operations authorized at and above 5,000 feet AGL (1,524 m)." **NOTE:** The proposed SEZ is located below a desert MOA with airspace authorized and utilized from 100 feet AGL to 60,000 feet AGL in northern areas, and 100 feet AGL to unlimited in the southern area. An authorized and utilized supersonic flight area exists 5,000 feet AGL over this SEZ. Desert Military Operating Area; airspace authorized/utilized from 100 feet above ground level to 60,000 feet AGL for the northern portion to unlimited for the southern portion. As a result of the cumulative impacts, we request the proposed Upper Dry Lake (Texas Lake) Valley North site be removed from consideration as a solar development zone.	
11.4.1.3 *Summary of Major Impacts*	Table 11.4.1.3-1	Recommend the following revision to Table 11.4.1.3-1 "Summary of Impacts of Solar Energy Development within the Proposed Dry Lake (Texas Lake) Valley North SEZ and SEZ Specific Design Features" *Military and Civilian Aviation* -- The proposed Dry Valley Lake North SEZ is covered by two military training routes (MTRs) with 200 feet (61 m) AGL operating limits and a major special use airspace zone permitting low-level supersonic flight. Noise and overpressure impacts resulting from supersonic flight	

		may adversely impact solar technology or infrastructure in the SEZ. Also, solar technology possessing reflectivity characteristics may create severe glint and glare hazards for aircrew operating in approved airspace. Further, DoD has indicated that solar technologies requiring structures higher than 50 feet (15 m) above ground level may present unacceptable electromagnetic compatibility concerns for their test mission. As a result of the cumulative impacts, we request the proposed Upper Dry Lake (Texas Lake) Valley North site be removed from consideration as a solar development zone.	
11.4.6 *Military and Civilian Aviation*	11.4.6.2 *Impacts* Line 23	Recommend adding the following: … "Supersonic flight operations conducted at and above 5,000 AGL in military airspace above and proximal to the SEZ may produce significant noise and subsequent overpressure concerns…." As a result of the cumulative impacts, we request the proposed Upper Dry Lake (Texas Lake) Valley North site be removed from consideration as a solar development zone.	
11.4.15 *Acoustic Environment*	11.4.15.1 *Affected Environment* Line 16/26	Recommend adding the following: … "Additionally, military training routes (MTRs) authorizing supersonic flight at and above 5,000 AGL exist directly above the SEZ." As a result of the cumulative impacts, we request the proposed Upper Dry Lake (Texas Lake) Valley North site be removed from consideration as a solar development zone.	
11.4.15 *Acoustic Environment*	11.4.15.2 *Impacts*	Recommend adding the following: -- Noise and associated overpressures created by authorized supersonic flight above and proximal to the SEZ may adversely affect	

		solar technology and/or infrastructure. As a result of the cumulative impacts, we request the proposed Upper Dry Lake (Texas Lake) Valley North site be removed from consideration as a solar development zone.	
11.5		**EAST MORMON MOUNTAIN SEZ**	
11.5.6 *Military and Civilian Aviation*	11.5.6.2 *Impacts*	NOTE: At this time, *with respect to Nellis AFB and NTTR operations only*, the East Mormon Mountain location is the most compatible SEZ area for taller solar technologies. However, analysis has been conducted only to a height of 700 feet AGL. Technologies that require structures in excess of 700 feet AGL would require additional analysis, including a review of construction plans and technology design features.	
11.6 **11.7**		**GOLD POINT SEZ** **MILLER SEZ**	
11.6 and 11.7 FOR DOD READER INFO ONLY		Previous concerns submitted by DoD addressing the proposed Gold Point and Miller SEZs have been incorporated into the December 2010 Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States, Vol 5, Part 1, Chapter 11.	

Thank you for your comment, John Crow.

The comment tracking number that has been assigned to your comment is SolarD11749.

Comment Date: April 21, 2011 15:20:47PM
Solar Energy Development PEIS
Comment ID: SolarD11749

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Privacy Preference: Don't withhold name or address from public record
Attachment: DoD Solar PEIS Comments-3 Apr 20 2011.pdf

Comment Submitted:

As a Cooperating Agency, per the Memorandum of Agreement dated 8 July, 2009, these three attachments represent the DoD Regional Environmental Coordinator Region 9 installation-coordinated comments for the Solar Energy Development Draft Programmatic Environmental Impact Statement for solar energy development in the six southwestern state area. These comments were routed to and reviewed by the newly established DoD Energy Siting Clearinghouse in Washington, DC.

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Thank you for the opportunity to review and comment on this important document. These comments were also submitted via email to Ms. Resseguie.
Submitted on behalf of DeEllen M. Brasher.

Enclosure A

Analysis of the Solar Energy Development Program Alternative for the BLM Solar PEIS

Purpose: To inform interested parties of the military mission impacts for possible solar development in areas around White Sands Missile Range (WSMR).

Background: As a common frame of reference, the following map is provided:

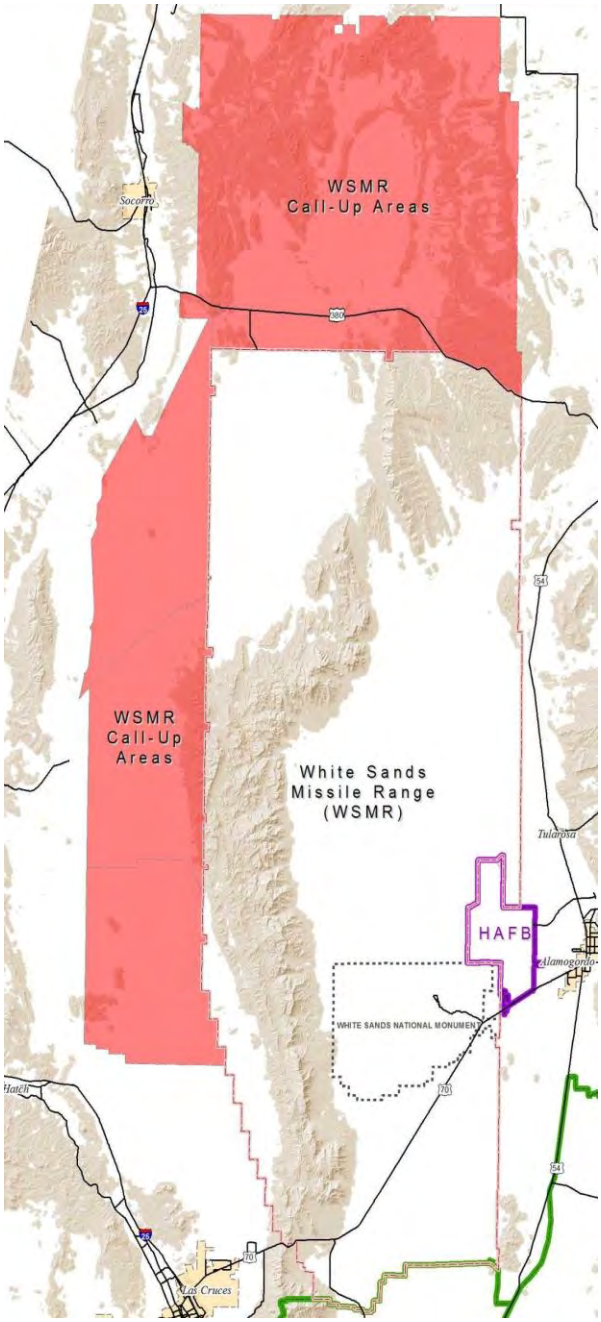

Figure 1

Analysis: White Sands Missile Range (WSMR) possible military issues concerning proposed solar development are listed below. Please note that a more definitive military impact analysis is not possible until additional information is provided on the proposed solar development. Additional information should include heights of any structures, power levels, substation locations, and National impact if developments are damaged. In the absence of detailed information, WSMR assumed some common configurations and provided a preliminary impact assessment. For simplicity purposes, the following areas of potential development are assessed for the potential impact to the WSMR military missions. The areas are delineated in this document as: Far North, Near North, and Near West (see figure 2).

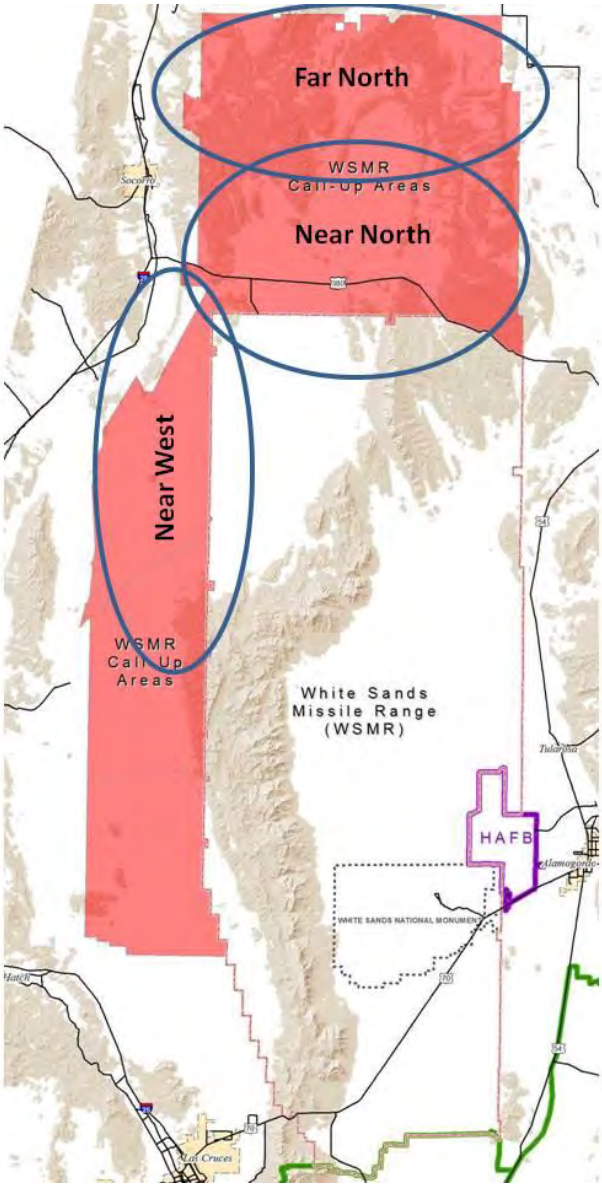

Figure 2

a. **Far North Group**. The area includes the safety fans employed for a variety of surface to air and air to ground systems (figure 3). The estimated impact to WSMR operations is considered less then significant.

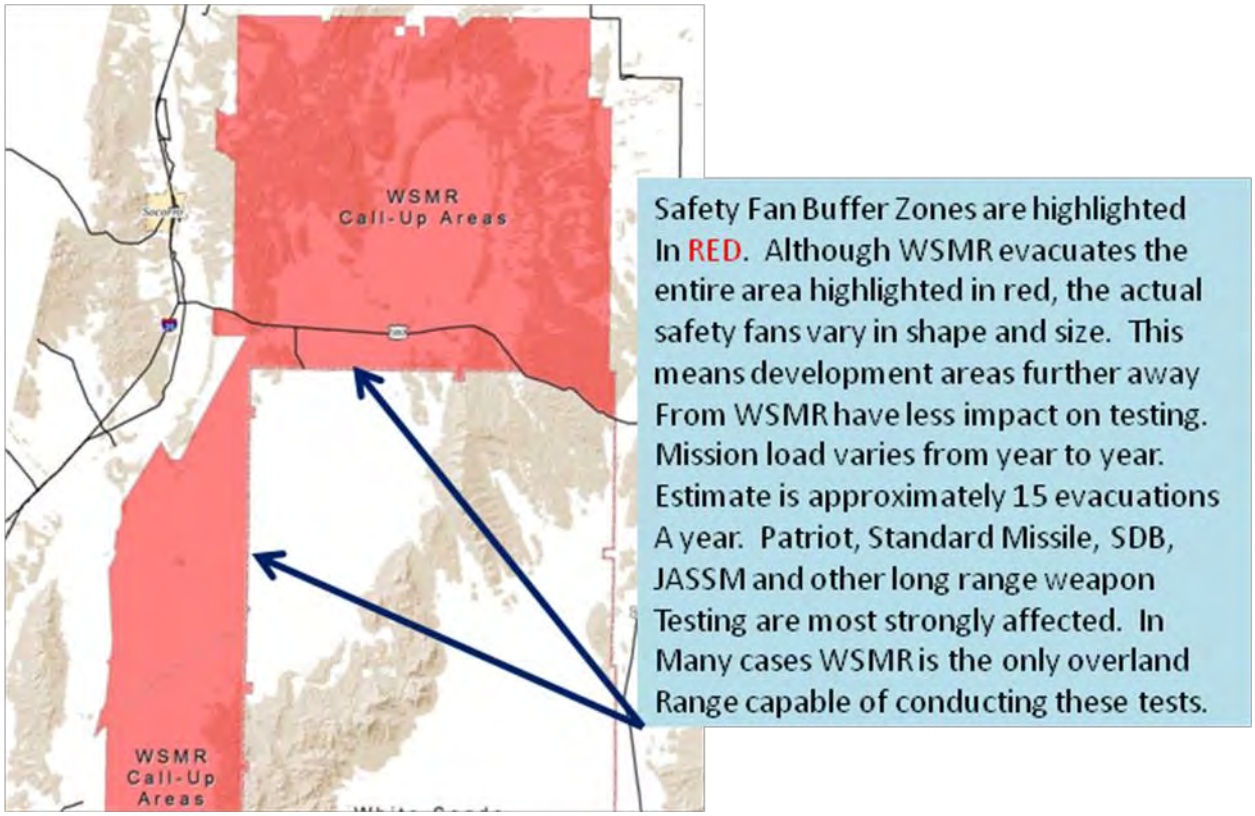

Figure 3

b. **Near North Group**. Development in the Near North area could have a significant impact on DoD missions.

   i. Safety Fan Debris. The Near North Group has similar concerns as identified for the Far North Group, but as it is closer to WSMR land, the impact is greater. The closer proximity results in a significantly greater number of safety fans overlays and a resultant increase in risk to infrastructure or relocation of mission profiles. The relocation alternative has the effect of reducing the size of WSMR. The impact of these routes would preclude the use of WSMR for these missions.

   ii. Target Debris. Target Debris from LC94 may damage any development near this area (figure 4). Programs include Patriot, THAAD, MDA agency. Mission load varies significantly from year to year. Conservative estimate is approximately 1 mission per year. Debris patterns vary based on target used. The estimated impact to WSMR operations is considered significant.

iii. EMI. Airborne C-IED systems will be negatively affected by high voltage powerlines and substations in the Near North Group. The impact will be a reduction in the area these systems can be tested and has the effect of reducing the WSMR airspace (see figure 5). The impact to WSMR operations is considered significant.

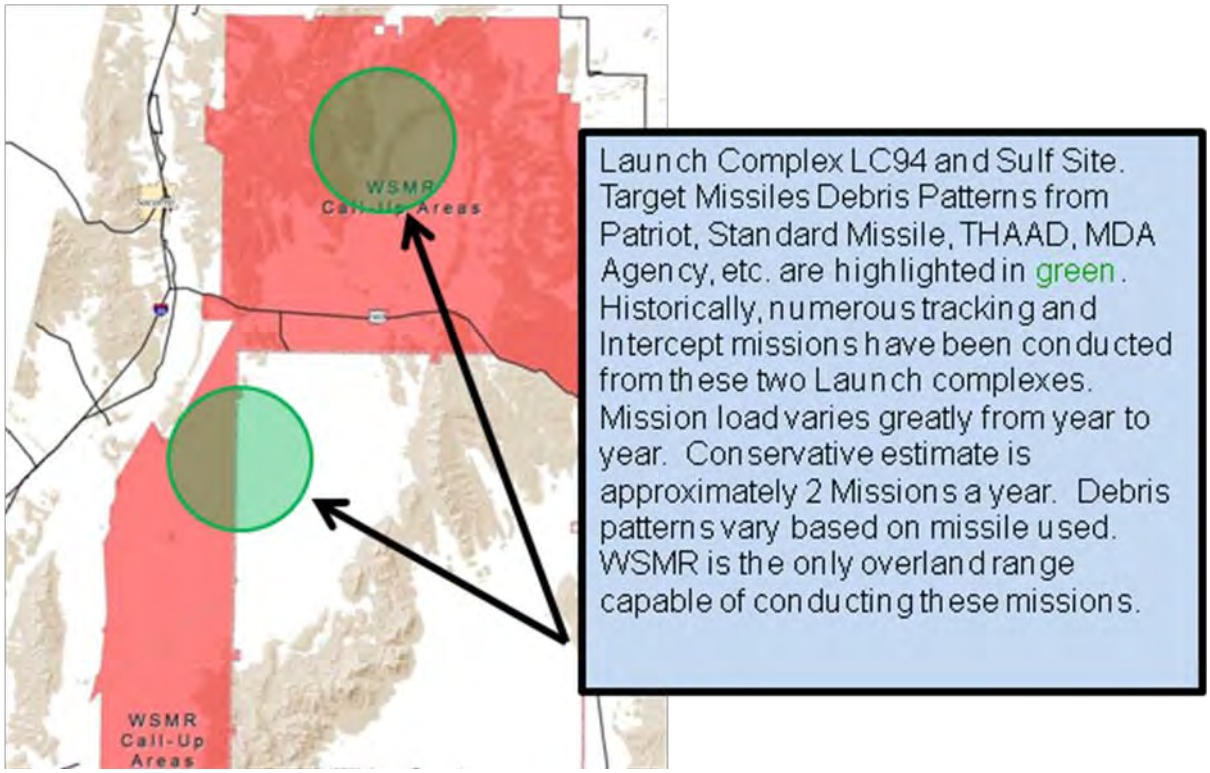

Figure 4

c. **Near West Group**. Development in the near west area has a significant impact on DoD missions.

i. Target Debris. Target Debris from Sulf Site may damage any solar development. Programs supported from this site include Patriot, Standard Missile, THAAD, MDA agency, and others. Mission load varies significantly from year to year. Conservative estimate is approximately 1 mission per year. Debris patterns vary based on target used. In addition to target debris, the area includes the safety fans employed for a variety of surface to air and air to ground systems (figure 4). Excluding the potential loss of the use of Sulf Site, which could be mitigated, the estimated impact to WSMR operations is considered significant.

ii. EMI. Airborne C-IED systems will be negatively affected by substations and high voltage powerlines in the Near West Group. The impact will be a reduction in the area these systems can be tested and has the effect of reducing the WSMR airspace (see figure 5). Some potential areas are close to Joint Directed Energy Test Site

(JDETS) testing and will adversely impact C-IED testing. The impact to WSMR operations is considered significant.

iii. Safety Fan Debris. The Near West Group encompasses numerous safety fans (figure 3). The close proximity results in a significant number of safety fans overlays and a resultant increase in risk to infrastructure or relocation of mission profiles. The relocation alternative has the effect of reducing the size of WSMR. Systems particularly affected include Small Diameter Bomb, Standard Missile, Patriot, and others. The impact of these routes precludes execution of these missions at WSMR.

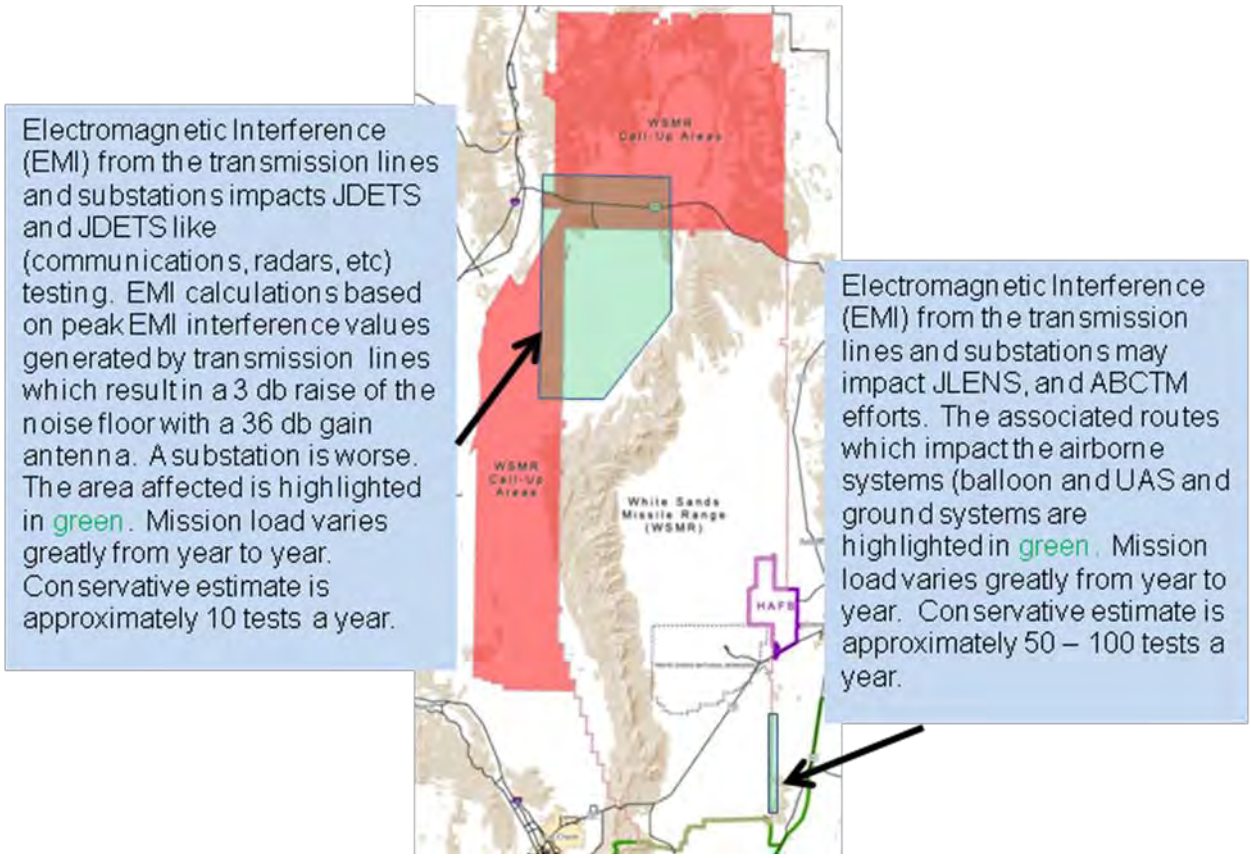

Figure 5

Additional considerations

Infrastructure Safety. Damage to Solar development infrastructure must be taken into account by the Department of Defense. WSMR conducts developmental testing for a wide variety of weapon systems. WSMR has a unique combination of land and military restricted airspace which is from surface to unlimited. The combined airspace and land space makes WSMR the **only** choice in CONUS for many missile and rocket tests. Despite the vast land area available, WSMR frequently needs longer ranges to

accommodate long-range systems. In addition to ballistic systems capable of extremely high speeds, WSMR tests low-velocity systems, such as cruise missiles capable of flying as low as 60 feet above ground level and requiring wide safety exclusion areas. WSMR has long-standing agreements with bordering land owners to temporarily use adjacent lands to launch from and fly through. Often, these lands must be evacuated due to safety buffers costing the Army 2 million dollars a year. In addition to aerial collisions and explosive ordnance dangers, WSMR conducts testing on Directed Energy (DE) systems. Infrastructure Safety hazards are a function of relative proximity to WSMR land. The fact that the development areas are not physically on WSMR land mitigates, but does not eliminate the hazards. The system effects and safety buffer zones significantly exceed WSMR boundaries; which is why the evacuation areas are necessary.

Electromagnetic Interference. Some testing, such as Counter-Improvised Explosive Device (C-IED), is conducted at WSMR because the electromagnetically quiet environment allows the establishment of baseline characterizations. This type of testing is critical to the safety of U.S. and Allied forces currently engaged in Combat and Counter-Insurgency operations. Again, the concern increases with proximity to WSMR land. Since EMI is a function of power and distance, the risk increases geometrically.

An example to exemplify the impact on WSMR Military missions is testing involving low flying cruise missile threats. Effective testing requires these systems to be flown at very low altitude to make it difficult for search radars to detect them. The northern part of WSMR and its associated call up areas have very little infrastructure and have a very low RF ambient background noise floor. Many systems require very low back ground noise and areas with little to no infrastructure (like power towers/substations/powerlines that reflect and emanate RF energy). If the ambient noise floor is too high then systems will not be able test their actual detection ranges in a benign environment (important for all targets, but critical for low RCS targets). These baseline measurements are critical to define the performance envelope of a system. The system's performance envelope will then bound the operational tactics, techniques, and procedures used by the operators. The presence of a solar development with high voltage power lines and substation will directly impact the reason the federal government set aside this land and airspace (zero to infinity) for DoD and will preclude its use as intended. Systems affected by this threat include Patriot, Standard Missile, AMRAAM, AIAMD, NIFC-CA, and JLENS.

Finally one of the most compelling arguments is the impact energy development will have on emerging technology testing. Continuing development of weapon and sensor systems to defeat the evolving threats makes it very difficult to predict how much land and airspace is required for future testing. Three years ago, no one would have thought the country needed a large aero-acoustic range requiring very low background noise (acoustic noise). The **only** place in the country that could host the facility was WSMR because of the low amount of infrastructure encroachment. This facility now helps operational UAS fly closer to insurgents in theater before dropping their ordnance. Five years ago, no one would have thought the country needed a large low infrastructure encroachment C-IED facility for testing HPM technologies to defeat IEDs. The **only** place found in the country for this facility was WSMR. This facility has fielded numerous C-IED systems to protect US troops from the most significant

threat they face in Iraq and Afghanistan. The historical trends strongly point to the need for more land and airspace that can be isolated from the encroachment of infrastructure.

Recommendation: In the absence of mitigation concepts, the areas near the northwestern corner of WSMR are the ones which will have the most impact for solar development for WSMR.

Acronyms

ABCTM	Army Brigade Combat Team Modernization
AIAMD	Army Integrated Air and Missile Defense
AMRAAM	Advanced Medium-Range Air-to-Air Missile
BLM	Bureau of Land Management
C-IED	Counter Improvised Explosive Device
CONUS	Continental United States
DoD	Department of Defense
EMI	Electromagnetic Interference
JASSM	Joint Air-to-Surface Standoff Missile
JDETS	Joint Directed Energy Test Site
JLENS	Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System
LC94	Launch Complex 94
MDA	Missile Defense Agency
NIFC-CA	Naval Integrated Fire Control - Counter Air
RCS	Radar Cross Section
SDB	Small Diameter Bomb
THAAD	Theater High Altitude Area Defense
UAS	Unmanned Aircraft Systems
USAF	Untied States Air Force
WSMR	White Sands Missile Range

Enclosure B

Comments on Solar PEIS documentation

General Comments:

1. Need further detail regarding the "land use planning process" proposed as part of the alternatives involving SEZ sites and consideration of non-SEZ sites as well. Spifically, detail is needed that describes how changes, deletions, or additions to SEZ sites will be evaluated, the constraints or attributes for/against SEZ status, and why these additions, changes or modifications to SEZ sites were approved or disapproved.

2. Need detail regarding what is meant by "conflicting uses" and examples of expected "conflicting uses". Additionally, it is unclear who will assist the BLM in the determination of conflicting uses and the process for determining same.

3. How will "comprehensive program administration and authorization policies" mitigate or minimize "SEZ-specific conflicts?

4. Using SEZ areas are preferred because:

    a. Limits development of undisturbed lands

    b. Limits construction of roads and support facilities

    c. Limits potential for erosion due to construction

    d. Limits or helps contain urban development

    e. Creates energy source near consumers

    f. Limits or reduces need to build transmission lines since energy close to users.

Specific Comments:

Page ES-15, Table ES.2-5: Under the "Solar Energy Development Program Alternative" the comment "Impacts potentially could be dispersed across the 22 million acres." While the "SEZ Program Alternative" states "…impacts would be concentrated into a smaller, known geographic area." I think these statements are misleading. The impacts are going to be dispersed across the 22 million acres available it's just the specific areas have already been identified and closely evaluated. What is not clear is how any area not identified as an SEZ will actually be evaluated. How much input and what type of influence will an outside agency have to the later evaluation? Also, once a site is chosen, the impacts are still going to be in a small geographic area.

Page ES-29, Lines 20-23: How/when to outside agencies provide a detailed evaluation and provide measured input if sites other than the SEZ are chosen?

Page ES-39, Lines 21-26: This paragraph makes it sound like you don't want to take the time to try to evaluate this aspect. Most impacts are difficult to quantify.

Page 1-14, Lines 3-7: This analysis needs to be done at some time since it can have a big impact on many areas.

Page 1-14, Lines 31-34: How would this analysis be done exactly to ensure proper input and just evaluation to include outside agencies?

Page 1-17, Lines 5-7: Since additional NEPA analysis is made a case-by-case basis at the time a solar energy project application is received, how are outside agencies assured they will be involved in the NEPA analysis and that the additional NEPA analysis is adequate?

Pages 2-4, 5, Solar Energy Program Administration and Authorization Policies, paragraph one: Does this provide outside agencies with at least as much influence over alternative selections in future developments as NEPA? It is not clear.

Page 2-11, Lines 26-30: What is the appropriate environmental analysis? Does this include outside agency involvement at a level consistent with NEPA?

Page 2-14, Lines 25-26: Need to assure outside agency involvement at a level consistent with NEPA if changes are made to the SEZs.

Page 3-4, Lines 40-41: This is an obstruction for aviation.

Page 3-21, Section 3.2.3 Operations: If a site is located in the Evacuation areas (north and west of WSMR), there would be periods of time when the location would have to be evacuated of people.

Page 3-23, Section 3.2.5 Transmission Lines: Development and siting of transmission lines is of great concern to the military installations in southern New Mexico. Upgrades over 345 kV can have a big impact on the military mission and upgrades should not be assumed. Location of new transmission lines again could have an impact on the military mission and should not be assumed.

Page 3-27, Lines 40-41: Add compatible land use with the military mission.

Page 3-29, Section 3.4.1 Construction: If sites are chosen in the northern or western evacuation areas for WSMR, coordination of schedules would be needed for evacuation of all construction workers – this could have a major impact if there were 1000 workers. This should be considered for any evaluation of site location.

Page 3-45, Lines 18-20: "….reflected light ….could cause eye injury…", typical operation of solar energy panels was thought it could be dealt with by pilots of military aircraft. This sounds outside of typical. There are a great many military aircraft flown in the Red Sands area at all hours of the day. If this is truly a concern, more information is needed so it can be evaluated.

Page 3-46, Section 3.6.3 Electric and Magnetic Fields: The ElectroMagnetic Interference (EMI) issue for military installations should be explained here. There are several military installations that require a very quiet "EMI site" for certain types of testing. Testing sites have been established in these areas because they are "quiet". Moving these sites is not an option. Additional substations and transmission lines located near these sites will eliminate the ability of the military to conduct these missions. Locating in these specific areas will have a big impact on the military mission and must be part of the evaluation.

Page 4-15, Line 10: Should add "…..training and testing operations….."

Page 4-16, Figure 4.6-1: There is supposed to be at least one MTR which goes over the Mason Draw SEZ that goes down to 100 AGL that is not included in this map. Are there others?

Page 5-17, Section 5.6.1 Common Impacts: I think the EMI impacts discussed above (page 3-46) should be included here also.

Page 5-17, Line 49: "….radar use, both ground and/or airborne systems, and other operations."

Page 5-18, Lines 17-20: If there is a safety-of-flight issue, development should not be allowed in an area nearby airports, or MTRs and SUAs.

Page 5-18, Lines 34: Should include "…training and/or testing space….."

Page 5-274, lines 27-29: Requirement for aircraft to fly at least 900 feet above power tower to reduce any potential eye injury. In the Red Sands area due to testing and training activities and airport approach for landing, I think this would be impossible.

Page 6-6, Table 6.1.2, Military and Civilian Aviation: For the SEZ Program Alternative, impacts would be concentrated into a smaller, known geographic area that has been evaluated to a greater degree by the military than the Solar Energy Development Program Alternative – this is a good thing.

Page 6-28, Table 6.1-3, both Mason Draw and Red Sands: Does not discuss any of the military impacts. E.g. Power tower development should be prohibited to avoid visual impacts, what about aviation impacts? There are others that have been discussed above.

Page 6-32, Lines 4-12: "…the decisions implemented ……..to the extent appropriate." What does this and the remainder of the paragraph really mean? The "design feature" for military issues is to discuss the project with the military, try to develop mitigations, but what happens if a mitigation is not possible and there is a major impact on the installations military mission, up to and including elimination of a specific mission? It is not clear how this will be handled.

Page 6-33, Lines 28-29: "….development could proceed with very limited additional environmental analysis." How is that determined? What kind of input do outside agencies have on this?

Page 6-43, Section 6.2.4: While flexibility is needed, thorough evaluation is still needed for areas not considered as an SEZ.

Page 6-49, Table 6.4-1, Objective "Minimize potential environmental impacts": "Additional mitigation required in SEZs" is listed under SEZ Program Alternative, why is it not included under Solar Energy Development Program Alternative? Since there is less evaluation of lands under the Solar Energy Development Program Alternative it would seem additional mitigation would be required there also.

Page 6-92, Lines 20-21: "Airports are generally located….at some distance from prospective solar development areas." This is not true for Red Sands, it is near and in the landing flight path for the Alamogordo Airport.

Page 12.1-2, Figure 12.1.1.1-1: White Sands Missile Range is not in the location that you have identified on the map – that is actually Ft. Bliss. White Sands Missile Range is north of that.

Page 12.1-47, Line 28-30: Since there are no military training routes or airspace in this area is this what you want to say? Doesn't hurt anything and we like for you to keep reinforcing this, but I don't think it's necessary.

Page 12.1-371, line 42: "…employs approximately 2700 military personnel and contractors". Change to "…and employs approximately 5500 military and civilian personnel and contractors."

Page 12.2-6, Table 12.2.1.3-1; Military and Civilian Aviation, SEZ-Specific Design Features: Would it not be best to eliminate the "power tower" type of solar technology for this SEZ due to the constraints of the military mission and the military and civilian airfields? Also to agree with the write-up on pg 12.2-37, Section 12.2.6.3, should it not at least include the information listed there?

Page 12.2-37. Section 12.2.6.3: In addition to early coordination with DoD, why not eliminate the "power tower" type of solar technology for this SEZ due to military impacts?

Page 12.3-6. Table 12.3.1.3-1, Military and Civilian Aviation: As stated above, In addition to early coordination with DoD, why not eliminate the "power tower" type of solar technology for this SEZ due to military and civilian aviation impacts?

Page 12.3-37, Lines 8-13: With the description given in this paragraph and to be consistent with other Military and Civilian Aviations sections in this document, why would "…only a small portion of the southwestern portion of the SEZ as requiring consultation with DoD prior to approval of any facilities that might have an impact on military uses"? Anything developed in this area would need consultation with DoD as is stated on page 12.3-38, lines 24-25.

Page A-27, Lines 25-27: "….coordinate with the DoD…..regarding the location of solar power tower projects early in the application process." While this is vital, why is it limited to solar power tower projects? Throughout this document it states notification and coordination with DoD for all solar projects.

Page A-31, Lines 19-22: "Potentially affected federal, state, local and Tribal land managers and government agencies should be invited to participate as cooperating agencies….". This implies they may not be "invited" therefore not given the opportunity to participate.

Page A-37, Line 18: Does this include military airports?

Page A-162, Red Sands, Military and Civilian Aviation: This line should be added to the Mason Draw section also.

Thank you for your comment, Drew Martin.

The comment tracking number that has been assigned to your comment is SolarD11750.

Comment Date: April 21, 2011 20:33:52PM
Solar Energy Development PEIS
Comment ID: SolarD11750

First Name: Drew
Middle Initial:
Last Name: Martin
Organization:
Address: 500 Lake Ave. #102
Address 2:
Address 3:
City: Lake Worth
State: FL
Zip: 33460
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I believe that Solar Energy projects should not harm endangered species. That species such as the desert tortoise be protected in the installation of large solar projects and that all environmental laws be carefully adhered to in the building of Solar Energy projects.

Thank you for your comment

The comment tracking number that has been assigned to your comment is SolarD11751.

Comment Date: April 22, 2011 09:35:16AM
Solar Energy Development PEIS
Comment ID: SolarD11751

First Name: [Withheld by requestor]
Middle Initial:
Last Name: [Withheld by requestor]
Organization:
Address:
Address 2:
Address 3:
City:
State:
Zip:
Country:
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

GO SOLAR

Thank you for your comment, Brittany Paniagua-Berlanga.

The comment tracking number that has been assigned to your comment is SolarD11752.

Comment Date: April 22, 2011 11:52:14AM
Solar Energy Development PEIS
Comment ID: SolarD11752

First Name: Brittany
Middle Initial: A
Last Name: Paniagua-Berlanga
Organization:
Address: 3200 S. Aberdeen
Address 2:
Address 3:
City: Chicago
State: IL
Zip: 60608
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Once amended, we strongly support the Solar Energy Zone alternative, which would concentrate solar development within parcels of land that avoid needless future conflicts with national park resources and sensitive desert ecology.

There are four proposed Solar Energy Zones (SEZ) that threaten our national parks.

* The Riverside East SEZ must be reconfigured to reduce impact to Joshua Tree National Park's wilderness and wildlife corridors.
* The Iron Mountain SEZ must be removed to prevent impacts to Joshua Tree National Park's remarkable scenery and wildlife.
* The Amargosa Valley SEZ must be reduced or reconfigured to reduce negative impact to Death Valley's wilderness and precious water resources, including desert wetlands home to endangered species such as the Devil's Hole Pupfish.
* Similarly, the Red Sands SEZ threatens water resources critical to wildlife and the formation of desert dunes at White Sands National Monument.

Any proposed solar projects sited within 15 miles of a national park boundary should trigger a consultation with the National Park Service to determine whether the project unacceptably impacts or diminishes national park resources or visitor enjoyment. Finally, it is vital that the BLM include proposed national parks, wilderness areas, and national monuments as high conflict areas for industrial solar development.

Thank you for your comment, Kathleen Medina.

The comment tracking number that has been assigned to your comment is SolarD11753.

Comment Date: April 22, 2011 13:33:55PM
Solar Energy Development PEIS
Comment ID: SolarD11753

First Name: Kathleen
Middle Initial:
Last Name: Medina
Organization:
Address:
Address 2:
Address 3:
City:
State:
Zip:
Country:
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

We need responsible solar energy development.

Thank you for your comment, Ann Garth.

The comment tracking number that has been assigned to your comment is SolarD11754.

Comment Date: April 22, 2011 14:06:59PM
Solar Energy Development PEIS
Comment ID: SolarD11754

First Name: Ann
Middle Initial:
Last Name: Garth
Organization:
Address:
Address 2:
Address 3:
City:
State:
Zip:
Country:
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

This is fantastic. We need to support this.

Thank you for your comment, Frances Howell-Coleman.

The comment tracking number that has been assigned to your comment is SolarD11755.

Comment Date: April 22, 2011 14:17:11PM
Solar Energy Development PEIS
Comment ID: SolarD11755

First Name: Frances
Middle Initial:
Last Name: Howell-Coleman
Organization:
Address:
Address 2:
Address 3:
City:
State:
Zip:
Country:
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Do NOT threaten Joshua Tree!

Thank you for your comment, Leslie Gallagher.

The comment tracking number that has been assigned to your comment is SolarD11756.

Comment Date: April 22, 2011 19:54:02PM
Solar Energy Development PEIS
Comment ID: SolarD11756

First Name: Leslie
Middle Initial:
Last Name: Gallagher
Organization:
Address: 2240 Federal Ave.
Address 2:
Address 3: 2240 Federal Ave.
City: LA
State: CA
Zip: 90064
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Support solar energy development only within appropriately sited Solar Energy Zones that do not harm our national parks.

Thank you for your comment, Emily Quinn.

The comment tracking number that has been assigned to your comment is SolarD11757.

Comment Date: April 23, 2011 00:00:40AM
Solar Energy Development PEIS
Comment ID: SolarD11757

First Name: Emily
Middle Initial:
Last Name: Quinn
Organization:
Address: Kihei Rd
Address 2:
Address 3:
City: Kihei
State: HI
Zip: 96753
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Cloudy Germany is a leader in solar power. We can do it too.

Thank you for your comment, Andrea Hall.

The comment tracking number that has been assigned to your comment is SolarD11758.

Comment Date: April 23, 2011 12:43:59PM
Solar Energy Development PEIS
Comment ID: SolarD11758

First Name: Andrea
Middle Initial:
Last Name: Hall
Organization:
Address: 3655 Chicora Ct., #220
Address 2: #220
Address 3:
City: Fort Worth
State: TX
Zip: 76116
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I only support solar energy development within appropriately sited Solar Energy Zones that do not harm our national parks. I want clean energy resources, but not at the expense of animal welfare and I know that you can find a space that will work for solar energy and not harm animals.

Thank you for your comment, Avonna Vinje.

The comment tracking number that has been assigned to your comment is SolarD11759.

Comment Date: April 23, 2011 12:52:58PM
Solar Energy Development PEIS
Comment ID: SolarD11759

First Name: Avonna
Middle Initial: L
Last Name: Vinje
Organization: none
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

The proposed area for LaPaz County/Quartzsite area is NOT listed in the Solar Energy Zones revised 12/2010. We DO NOT have extra water resources available AND it would not benefit our area going to CA, PLUS there is not enough labor in our community so they will bring in transients with no housing available. BLM land and Indian land extends right to the Colorado River. Go to them!

Thank you for your comment, Byard Bost.

The comment tracking number that has been assigned to your comment is SolarD11760.

Comment Date: April 23, 2011 14:56:24PM
Solar Energy Development PEIS
Comment ID: SolarD11760

First Name: Byard
Middle Initial: T
Last Name: Bost
Organization:
Address:
Address 2:
Address 3:
City:
State: NC
Zip: 28115
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Once amended, I strongly support the Solar Energy Zone alternative to concentrate solar development within parcels of land that avoid needless future conflicts with national park resources and sensitive desert ecology.

Four proposed Solar Energy Zones (SEZ) threaten our national parks:

1. The Riverside East SEZ must be reconfigured to reduce impact to Joshua Tree National Park's wilderness and wildlife corridors.
2. The Iron Mountain SEZ must be removed to prevent impacts to Joshua Tree National Park's remarkable scenery and wildlife.
3. The Amargosa Valley SEZ must be reduced or reconfigured to reduce negative impact to Death Valley's wilderness and precious water resources, including desert wetlands home to endangered species such as the Devil's Hole Pupfish.
4. Similarly, the Red Sands SEZ threatens water resources critical to wildlife and the formation of desert dunes at White Sands National Monument.

Also, any proposed solar projects sited within 15 miles of a national park boundary should trigger a consultation with the National Park Service to determine whether the project unacceptably impacts or diminishes national park resources or visitor enjoyment. Finally, it is vital that the BLM include proposed national parks, wilderness areas, and national monuments as high conflict areas for industrial solar development.

Thank you for your comment, Joel Peterson.

The comment tracking number that has been assigned to your comment is SolarD11761.

Comment Date: April 23, 2011 14:57:51PM
Solar Energy Development PEIS
Comment ID: SolarD11761

First Name: Joel
Middle Initial: Q
Last Name: Peterson
Organization:
Address: 31 Hastings Street
Address 2:
Address 3: 31 Hastings Street
City: West Roxbury
State: MA
Zip: 021322333
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I fully support the development of alternative energy sources but worry that local environmental and aesthetic issues may take a second seat to the rush to develop them.

Thank you for your comment, Gregory Shrader.

The comment tracking number that has been assigned to your comment is SolarD11762.

Comment Date: April 23, 2011 16:19:18PM
Solar Energy Development PEIS
Comment ID: SolarD11762

First Name: Gregory
Middle Initial: N
Last Name: Shrader
Organization:
Address: 3201 N. 38th St.
Address 2: Unit 26
Address 3:
City: Phoenix
State: AZ
Zip: 85018
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

National Parks are the natural choice to lead the nation in green energy!

Thank you for your comment, Jess Summers.

The comment tracking number that has been assigned to your comment is SolarD11763.

Comment Date: April 23, 2011 17:48:58PM
Solar Energy Development PEIS
Comment ID: SolarD11763

First Name: Jess
Middle Initial:
Last Name: Summers
Organization:
Address: 3318 Maplewood Ave.
Address 2:
Address 3: 3318 Maplewood Ave.
City: Richmond
State: VA
Zip: 23221
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

The use of solar energy is a resource we need to be utilizing as much as possible.

Thank you for your comment

The comment tracking number that has been assigned to your comment is SolarD11764.

Comment Date: April 23, 2011 19:46:19PM
Solar Energy Development PEIS
Comment ID: SolarD11764

First Name: [Withheld by requestor]
Middle Initial: [Withheld by requestor]
Last Name: [Withheld by requestor]
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

I think renewable energy is good, but not at the price of destroying the wild desert. I think it would be logical to study the dying cities and uproot the old structure and then put the solar panels there. Not a virgin land, I rather enjoy those deserts on my road trips, and I hope they remain for my children’s children to enjoy as well! Please find another option to build before you defile what is left of our wildreness.On my road trips I've seen MANY dilapidated cities that are deserving of a refurbishing by implementing your idea for energy. I understand you have a degree, please use it instead of just seeing those dollar signs! I stand firm when I say I disagree with your development plan, regardless of what it is for!

Thank you for your comment, Vanja Ivanova-Hathcock.

The comment tracking number that has been assigned to your comment is SolarD11765.

Comment Date: April 24, 2011 09:29:00AM
Solar Energy Development PEIS
Comment ID: SolarD11765

First Name: Vanja
Middle Initial: P
Last Name: Ivanova-Hathcock
Organization:
Address: 7070 21st Avenue
Address 2:
Address 3:
City: Sacramento
State: CA
Zip: 95820
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Solar energy should be developed only in solar energy zones that don't compromise national park wildlife, scenery, archaeological sites, water resources, night sky viewing, and the opportunity for present and future generations to fully enjoy America's heritage.

Thank you for your comment, Elizabeth Schrupp.

The comment tracking number that has been assigned to your comment is SolarD11766.

Comment Date: April 24, 2011 11:13:36AM
Solar Energy Development PEIS
Comment ID: SolarD11766

First Name: Elizabeth
Middle Initial: A
Last Name: Schrupp
Organization:
Address: 6223 Lavendale
Address 2:
Address 3:
City: Dallas
State: TX
Zip: 75230
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Please go solar

Thank you for your comment, Wayne Truax.

The comment tracking number that has been assigned to your comment is SolarD11767.

Comment Date: April 24, 2011 17:38:02PM
Solar Energy Development PEIS
Comment ID: SolarD11767

First Name: Wayne
Middle Initial:
Last Name: Truax
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

-Once amended, we strongly support the Solar Energy Zone alternative, which would concentrate solar development within parcels of land that avoid needless future conflicts with national park resources and sensitive desert ecology.

--There are four proposed Solar Energy Zones (SEZ) that threaten our national parks.

* The Riverside East SEZ must be reconfigured to reduce impact to Joshua Tree National Park's wilderness and wildlife corridors.
* The Iron Mountain SEZ must be removed to prevent impacts to Joshua Tree National Park's remarkable scenery and wildlife.
* The Amargosa Valley SEZ must be reduced or reconfigured to reduce negative impact to Death Valley's wilderness and precious water resources, including desert wetlands home to endangered species such as the Devil's Hole Pupfish.
* Similarly, the Red Sands SEZ threatens water resources critical to wildlife and the formation of desert dunes at White Sands National Monument.

--Any proposed solar projects sited within 15 miles of a national park boundary should trigger a consultation with the National Park Service to determine whether the project unacceptably impacts or diminishes national park resources or visitor enjoyment. Finally, it is vital that the BLM include proposed national parks, wilderness areas, and national monuments as high conflict areas for industrial solar development.

Thank you for considering my point of view.

Thank you for your comment

The comment tracking number that has been assigned to your comment is SolarD11768.

Comment Date: April 24, 2011 23:38:12PM
Solar Energy Development PEIS
Comment ID: SolarD11768

First Name: [Withheld by requestor]
Middle Initial: [Withheld by requestor]
Last Name: [Withheld by requestor]
Organization: CARDENAS
Address: [Withheld by requestor]
Address 2:
Address 3: [Withheld by requestor]
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

Dear Peis,
My Name is Maria Cardenas and I have lived in the Coachella Valley for most of my life. I absolutely love it here. It would be devastating to find out one day that I am no longer permitted to live here and that is why I don't agree with the plans of using the lands for the renewable energy project. Although I am all for renewable energy, I don't think this is the right way to get it done. By helping our energy problem we are not only taking away lands that are public, but also helping lose a part of Indian culture and destroying the home of the desert tortoise. Precious parts of Indian culture are found at the center of this project and its unfair that they have to sacrifice their treasured sanctuaries when it's something that we wouldn't give up. Also, the public should have a say in these lands. Land shouldn't just be taken away like nothing without no one having an opinion about it. Lastly, the desert tortoise. We are always trying to protect our wildlife and now you just expect to overlook the fact that the area is the home of these beautiful creatures without carrying about the impact it will have on their population. They have the right to keep their home. By doing this, you're inviting a whole list of other problems. I think we are ready for renewable energy, we just need a better way to carry it out and I'm sure there is a way.
Thank you.

Thank you for your comment, John Fields.

The comment tracking number that has been assigned to your comment is SolarD11769.

Comment Date: April 25, 2011 14:22:38PM
Solar Energy Development PEIS
Comment ID: SolarD11769

First Name: John
Middle Initial: C
Last Name: Fields
Organization: California Rifle & Pistol Association (CRPA)
Address: 271 Imperial Highway Suite 620
Address 2:
Address 3:
City: Fullerton
State: CA
Zip: 92835
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Letter to California BLM offices and Response Letter.pdf

Comment Submitted:

2011 CRPA Opposition to Solar and Wind Energy Projects on Public Lands

CALIFORNIA RIFLE & PISTOL ASSOCIATION
SINCE 1875

California Rifle and Pistol Association, Inc.

271 Imperial Highway, Suite 620 • Fullerton, California 92835
(714) 992-$C_2R_7P_7A_2$ • FAX (714) 992-2996
www.crpa.org

Tony Montanarella
President
James M. Shea
Vice President
Robert W. Anderson
Secretary
Arlin L. Penner
Treasurer
John C. Fields
Executive Director

April 11, 2011

Bureau of Land Management
Jim Abbott, Acting State Director
California State Office
2800 Cottage Way, Suite W-1623
Sacramento, CA 95825-1886

RE: SOLAR AND WIND ENERGY PROJECTS ON PUBLIC LANDS

Dear Mr. Abbott:

In addition to protecting the lawful ownership and use of firearms, the California Rifle and Pistol Association (CRPA) supports federal, state, and local efforts to conserve wildlife habitat and preserve hunting traditions for future generations of Californians. Naturally, the CRPA was disappointed to learn that the Bureau of Land Management (BLM) had authorized two solar energy projects, and plans to authorize several more solar and wind energy projects on public lands presently open for hunting. The Association opposes any development on public lands that would consume wildlife habitat and threaten hunting opportunities. In light of these concerns, we offer the following for your consideration:

1. There is substantial documentation on each project; however, a simple question rises to the surface: Why would development be permitted on undisturbed lands, when disturbed lands are readily available? This question also has been raised by local residents and business leaders, the Press-Enterprise, and several environmental organizations. The CRPA recognizes California's current and future demands for power, and we support the advancement of alternative sources. While our desert lands are prime candidates for wind and solar developments, **we strongly oppose utilizing undisturbed desert habitat for such projects.** There are thousands of acres of disturbed desert- both private and public- that can be used for energy development.

We believe that developers should be required to exhaust those lands before BLM authorizes any development on undisturbed public land.

2. If BLM authorizes these proposals, it should ensure that the developments are designed to avoid interfering with hunting and recreation activities on nearby lands. Project boundaries should be clearly marked, signs should be placed in clear view, and access to the developments should not cut off accessibility to hunters and others that use our desert lands.

The CRPA appreciates the opportunity to comment on this matter, and we ask that you contact our office if you have any questions or wish to discuss our concerns.

Sincerely,

John C. Fields
CRPA Executive Director

cc: The CRPA Hunting & Wildlife Conservation Committee
Tom Pedersen, CRPA Legislative Liaison
Connie Conway, Assembly District 34
V. Manuel Perez, Assembly District 80
Jeff Gorrell, Senate District 37
Bob Blumenfield, Senate District 40
Barbara Boxer, U.S. Senator
Diane Feinstein, U.S. Senator

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
California State Office
2800 Cottage Way, Suite W1834
Sacramento, CA 95825
www.blm.gov/ca

In Reply Refer To:
3000
CA-910 (P)

APR 19 2011

APR 21 2011
C.R.P.A.

John C. Fields
Executive Director,
California Rifle and Pistol Association, Inc.
271 Imperial Highway, Suite 620
Fullerton, CA 92835

Dear Mr. Fields:

Thank you for your letter, dated April 11, 2011, regarding solar and wind energy development on public lands. The Bureau of Land Management (BLM) values your feedback about avoiding renewable energy development on undisturbed desert lands and structuring such development, if approved, to allow for continued hunting and recreation around project areas.

As you may be aware, a national Programmatic Environmental Impact Statement (PEIS) for solar energy development on BLM-managed lands is currently underway. BLM is considering whether to amend land use plans in six western states, including California, to allow for the operation of solar energy projects on BLM-managed lands. In February and March, BLM held fourteen public meetings in the west, including four in California, to hear feedback about the PEIS. Public comment will continue to be accepted until May 2. For more information about the PEIS, please visit http://www.solareis.anl.gov. I encourage you to submit the comments you addressed to me as public comments to the PEIS.

Also underway in California is the development of a Desert Renewable Energy Conservation Plan (DRECP). This plan is led by state and federal agencies and enhanced by the involvement of more than 30 stakeholders from environmental organizations, counties, utilities, recreational groups, tribes and renewable energy companies. The DRECP may serve as the basis for land use plan amendments for renewable energy development and conservation areas in California's deserts. All DRECP stakeholder meetings are open to the public. I encourage you to attend the DRECP meetings in person or listen in by phone. More information on the plan can be found at http://www.drecp.org.

Thank you once again for your comments, and for your interest in California's public lands.

Sincerely,

James Wesley Abbott
Acting State Director

Thank you for your comment

The comment tracking number that has been assigned to your comment is SolarD11770.

Comment Date: April 25, 2011 18:18:31PM
Solar Energy Development PEIS
Comment ID: SolarD11770

First Name: [Withheld by requestor]
Middle Initial: [Withheld by requestor]
Last Name: [Withheld by requestor]
Organization:
Address: [Withheld by requestor]
Address 2: [Withheld by requestor]
Address 3: [Withheld by requestor]
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

We MUST explore and SUPPORT all forms of Solar Energy. We must get off fossil fuels and all avenues MUST be explored. this is a most valuable way to spend my tax dollars!

Thank you for your comment, Anna Perry.

The comment tracking number that has been assigned to your comment is SolarD11771.

Comment Date: April 25, 2011 19:41:46PM
Solar Energy Development PEIS
Comment ID: SolarD11771

First Name: Anna
Middle Initial: L
Last Name: Perry
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

We desperately need a better source of energy. I am not moved by the "cleancoal" commercials. I am a college educated individual and I know that coal is not a cleaner source of energy. Removing carbon that the earth has spent centuries compressing is drastically changing our atmosphere and we must change our primary energy source before we change it beyond the point of supporting any life.

Thank you for your comment, Doreen Kelly.

The comment tracking number that has been assigned to your comment is SolarD11772.

Comment Date: April 25, 2011 20:02:49PM
Solar Energy Development PEIS
Comment ID: SolarD11772

First Name: Doreen
Middle Initial:
Last Name: Kelly
Organization:
Address: 436 Monponsett St.
Address 2:
Address 3:
City: Hanson
State: MA
Zip: 023412007
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Please consider our important plea.

Thank you for your comment, Jon Landon.

The comment tracking number that has been assigned to your comment is SolarD11773.

Comment Date: April 26, 2011 01:31:29AM
Solar Energy Development PEIS
Comment ID: SolarD11773

First Name: Jon
Middle Initial: A
Last Name: Landon
Organization:
Address: 6052 Gold Meadows Rd
Address 2:
Address 3:
City: Placerville
State: CA
Zip: 95667
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

-There are four proposed Solar Energy Zones (SEZ) that threaten our national parks.

* The Riverside East SEZ must be reconfigured to reduce impact to Joshua Tree National Park's wilderness and wildlife corridors.
* The Iron Mountain SEZ must be removed to prevent impacts to Joshua Tree National Park’s remarkable scenery and wildlife.
* The Amargosa Valley SEZ must be reduced or reconfigured to reduce negative impact to Death Valley's wilderness and precious water resources, including desert wetlands home to endangered species such as the Devil’s Hole Pupfish.
* Similarly, the Red Sands SEZ threatens water resources critical to wildlife and the formation of desert dunes at White Sands National Monument.

Thank you for your comment, Melissa Vatterott.

The comment tracking number that has been assigned to your comment is SolarD11774.

Comment Date: April 26, 2011 10:16:08AM
Solar Energy Development PEIS
Comment ID: SolarD11774

First Name: Melissa
Middle Initial: A
Last Name: Vatterott
Organization: University of Missouri - Columbia
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment: EIS Public Comment.doc

Comment Submitted:

Please see attached file.

FROM THE DESK OF
«FIRST» «LAST»

June 27, 2012

Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Dear Bureau of Land Management and Department of Energy,

Looking at the wide range of natural resources in the United States as well as our anthropogenic impact on such resources, it is no surprise that we must find alternatives to our current heavily-dependent use of fossil fuels. Implementing a Solar Energy Program in the West where the most potential for solar power utility exists is crucial to sustain the country's current activities in years to come. As a concerned citizen and young person of the United States, I am concerned about what the future may hold for my generation regarding the use of natural resources. Therefore, I am glad to see that the BLM has developed a PEIS for a Solar Energy Program in order to develop utility-scale solar energy development on BLM-administered lands.

It is evident from the Executive Summary that the BLM has thoughtfully considered the socioeconomic and environmental facets of its proposed Solar Energy Program. Reading of the objectives on page ES-3 demonstrates the understanding to make the program adaptable for multiple project types with minimal adverse effects, standardization of the authorization process for developing solar projects, and utilization of existing infrastructures as much as possible (ES-3). It is important to identify lands that can and cannot be utilized for utility-scale production of solar energy, establish mitigation requirements for development, and adapt existing land use plans to include elements of the Solar Energy Program, as the Program has responsibly established as its elements. In addition, it is pleasing to read that evaluation of the impacts to transmit connections to the already existing electrical grid system is incorporated in the analysis. While it is important that the energy potentially produced through the Program reaches people through existing infrastructure, we must evaluate the impacts of transferring the energy produced from the projects to such infrastructures.

After reading the Executive Summary of the PEIS, it appears that are two very different alternatives suggested. It is stated on page ES-6 of the Executive Summary that the PEIS recognizes not all BLM-administered lands are appropriate for solar energy development. Under the Solar Energy Development Program Alternative, lands that are not suitable or are likely to be unsuitable would not be included in development and therefore are lands currently not available for solar energy development. This alternative also would establish Solar Energy Zones (SEZs) that qualify for potential Right of Way (ROW) application. With time, the Solar Energy Development Program Alternative, the BLM would be able to adjust the number of SEZs as more information is gathered about the designated land. In addition, this alternative excludes a number of areas, some of which I do not fully believe are necessary but rather should be determined for exclusion on a case-by-case basis. For example, Exclusion 1 and 2 from Table ES.2-2 are of lands with slopes greater than or equal to 5% and lands with solar insolation levels less than 6.5 kWh/m2/day. While I understand that these proposed projects would entail a great deal of investment, I believe that areas with less than optimal conditions for solar energy

production should not be excluded solely based on highest efficiency (6-34). With a growing population and increased use of electronics daily, it is likely that our electricity needs are going to increase. Therefore, I believe the Solar Energy Development Program Alternative excludes land that could be determined for usability on a case by case basis.

The second alternative, the Solar Energy Zone Program Alternative, excludes lands outside of SEZs and would consider modifying SEZs as more information is gained following implementation of the SEZ Program Alternative. In addition to the drastic elimination of land included for possible utility-scale solar power projects, the SEZ Program Alternative and the SED Program Alternative vary significantly in potential amount of developable BLM-administered land. Table ES.2-1 states that under the SED Program Alternative and the SEZ Program Alternative, 21,581,154 and 677,384 acres are potentially developable, respectively (ES-6). Lastly, the Executive Summary described a No Action Alternative, continuing solar energy development in accordance with the current Solar Energy Policies (ES-12). Unlike the other two alternatives, the No Action Alternative would therefore determine the approval or rejection of future solar energy projects solely on a case by case basis (ES-12) without any guidelines and could potentially utilize much a greater area of land for utility-scale solar energy development. In my opinion, this alternative would be incredibly dangerous to wildlife as well as indirectly to humans. Lack of guidance for establishing utility-scale solar energy projects under this alternative could extend projects into sensitive areas. In addition, if roads or buildings are developed to accompany these projects, the increase in impervious surface could lead to greater erosion and sediment yield in nearby streams. These potential increases could create environmental quality concerns for both aquatic and terrestrial animals dependent on nearby water bodies but could also potentially create water quality concerns for humans.

I believe that BLM thoroughly demonstrated the potential environmental impacts of each alternative and after reviewing Table ES.2-5 and the overview of the program and each alternative, I believe that the Solar Energy Development Program Alternative is the best option for utility-scale solar energy development. Since the Solar Energy Development Program Alternative does not assess site-specific issues and species-specific issues but rather leaves them to be addressed in each specific project review, I believe the needs and concerns of the individual projects and those impacted can be more efficiently addressed (ES-5).

As stated previously, I highly value the implementation of energy source alternatives to fossil fuels for the sustainability of the American activities and believe that this development is a significant step in the right direction. However, we must carefully evaluate the repercussions of land management, especially in sensitive areas. It is also important that all stakeholders be rightfully represented and have their opinions heard for each individual project to ensure socially, economically, and environmentally responsible decision making. Thank you for your time and I look forward to seeing the development of utility-scale solar energy projects in the very near future.

Sincerely yours,

Melissa Vatterott

17307 Radcliffe Place Drive

FROM THE DESK OF
«FIRST» «LAST»

Wildwood, MO 63025

Thank you for your comment, April Sall.

The comment tracking number that has been assigned to your comment is SolarD11775.

Comment Date: April 27, 2011 14:00:16PM
Solar Energy Development PEIS
Comment ID: SolarD11775

First Name: April
Middle Initial:
Last Name: Sall
Organization: The Wildlands Conservancy
Address: 39611 Oak Glen Rd #12
Address 2:
Address 3:
City: Oak Glen
State: CA
Zip: 92399
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Desert Siting Criteria Memo June 29_FINAL_SENT.pdf

Comment Submitted:

April 25, 2011

Delivered via electronic submission to the BLM Solar PEIS website (http://solareis.anl.gov) and U.S. mail.

Linda Resseguie, BLM Solar PEIS Project Lead
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue - EVS/240
Argonne, IL 60439

Re: Comments on Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear Ms. Resseguie:

Thank you for the opportunity to comment on the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (DPEIS). The Wildlands Conservancy (TWC) also signed on to a larger group of environmental comments but would like to submit the following comments specific to our organization and position. TWC is a 501c3 non-profit conservation organization with the dual mission to preserve the beauty and biodiversity of the earth and to fund outdoor education programs for the youth. TWC has preserved more land in California with private funds than any other conservation organization and owns the largest nonprofit preserve system in CA. TWC is an advocate for the preservation of the unique and sensitive lands of the Mojave Desert, and we request that the following comments be applied to the PEIS to maintain the conservation, historic, and recreation values of these public lands.

TWC is very supportive of responsible renewable energy and eliminating our dependence on fossil fuel energy sources and reducing our carbon footprint. We lead by example and our first preserve was established off-the-grid and self-sufficient in 1995. Since that time we have installed photovoltaic solar arrays or wind mills on the majority of our preserves. We feel it is imperative that the siting of renewable energy projects and the greening of California's energy supply be accomplished while protecting our treasured landscapes and fragile ecosystems. TWC also has a vested interest in the current renewable energy discussion and corresponding developments being proposed on federal lands within the California desert region.

TWC is passionate about land conservation and preserving functioning ecosystems and initiated the largest private land acquisition project in U.S. History, The Catellus Land Purchase. Determined to prevent one of the great deserts of the world from being severed by development, TWC raised more than $45 million in private funds and gifted it to the American people. This gift was to ensure preservation of a 140-mile stretch of the Mojave Desert that includes a spectacular landscape of eroded granite mountains, seemingly endless valleys, heroic rock formations, cinder cones and sand dunes. The purchase of over 600,000 acres in the CA Desert connected Joshua Tree National Park to Mojave National Preserve with public conservation lands. These lands were gifted to the Department of Interior (DOI) for management with the understanding that they were purchased for conservation. President Bill Clinton, Vice President Al Gore, DOI Secretary Bruce Babbitt and BLM Director Tom Fry all praised and congratulated TWC on the conservation benefits of this legacy purchase. Just 4 years after the completion of the project, applications for industrial renewable energy development began to cover the CA Desert and threaten to undo this legacy conservation project.

The Department of the Interior and the Department of Energy created a 'land rush' in the CA desert beginning with the Energy Policy Act of 2005. Shortly after BLM publizied their goal to produce 15,000 megawatts of renewable energy on public lands by 2015. While we support the overall initiative to green America's energy supply, DOI and DOE did not create a framework and siting criteria to encourage responsible projects in the most appropriate locations and as a result a speculative rush followed. Economic incentives for industry were numerous including the low cost of 'leasing' public lands for projects, government American Recovery and Reinvestment Act (ARRA) grants and guaranteed loans, 'fast-tracked' project status, etc. By 2007 over 1.2 million acres of the CA desert were under application for industrial development and many of those applications were in areas with highly sensitive resources and proposing inefficient or unproven technology. Frustrated desert residients and enthusiasts were assured by BLM that the PEIS would be a planning document that would designate the best places for solar development on public lands and so far the draft greatly missed that mark.

The current preferred alternative is not only an enormous step backwards in the progress toward the development of a responsible renewable energy program, but it would be a waste of resources to continue with the PEIS if that remains the preferred alternative (PA). If the DOI wants to allow the potential for solar development on 22 million acres in the west, then the PEIS is just a smokescreen for a planning document since that would essentially be continuing the current status quo of accepting and processing applications for development on most public lands (National Parks, Wilderness and other Congressional designations being the only exclusions from development). DOI began the National Environmental Protection Act (NEPA) process with a scoping process in 2009 for designating solar enterprise zones (SEZ's) on approximately 350,000 + acres in the California Desert Conservation Area (CDCA). Now, the first draft of the PEIS DOI has changed to a PA that includes the SEZ plus the additional 22 million acres in the western 6 states, which completely changes the original intent and objective of the initial scoping Notice of Intent and public comments. In addition, the inclusion of the 1.7 additional acres in CA covers many of the lands in the Catellus Lands Purchase that were gifted for conservation and include the proposed Mojave Trails National Monument.

It is TWC's position that DOI should change the preferred alternative to the Solar Energy Zones (SEZ) alternative only (Alternative). Furthermore, the SEZ still need to be reduced and revised (see our September 2009 comments) for solar energy development to provide for long-term conservation and ecosystem functioning within the California Desert Conservation Area (CDCA). Also, the current draft does not account for how pending solar applications will be incorporated into the PEIS or potential zones, and thus how cumulative impacts will be assessed and minimized.

In an effort to facilitate the BLM's daunting task of identifying suitable public lands for solar development, a number of environmental organizations including TWC have worked together to develop a desert siting criteria memo specifically designed for use by the BLM in the California Desert Conservation Area (CDCA) back in 2008-9. Those criteria were intended to aid in identifying lands both within and outside the SESA's that are lower in environmental resources and sensitivity and thus, more appropriate for industrial development. In the recent draft of the PEIS, the DOI appears to have discounted those and all other conservation and science recommendations by selecting the current PA. This siting criteria memo is attached again and should be revisited and utilized in the Solar PEIS and SEZ designation if DOI is to uphold any of its conservation missions.

The current PA in the Draft Solar PEIS is detrimental to all of the conservation work that has been done in the western deserts and does not reflect any of the knowledge scientists and land managers have gained over recent decades in the fields of conservation biology and ecosystem management. The environmental community has tried to work diligently alongside BLM over the past 2 years to help identify disturbed and degraded lands, including public lands that would provide the least conflicts for development and minimize irreversible ecosystem damage to our fragile deserts. Unfortunately, these efforts seem to be disregarded in the current draft of the PEIS and PA.

In 2010, the DOI approved several "fast-track" projects , several of them with severe environmental damage and costs. Despite the information about numerous sensitive resources upon breaking ground, these projects have been allowed to continue on their previous requirements without any revisions or adjustments to project footprints, mitigation or overall approval. Additionally, since current policy is that 'The BLM will continue to process existing renewable energy applications both within and outside the solar energy study areas,' development is continuing in a crude framework. The DPEIS does not address how these pending, nor future applications will be treated in relation to the SEZ in CA.

There are many proposed uses, and much competition for, the public lands in the desert including, but not limited to conservation, recreation, mineral exploration, military expansion ,and renewable energy. While these are not all exclusive uses, BLM is charged with making many of these management decisions and allocations. Therefore, with regard to renewable energy, DOI should thoroughly evaluate the use of already disturbed lands (both private and public), and local distributed RE generation such as solar PV on rooftops of commercial and residential buildings to incorporate many alternatives and solutions into America's energy model. As TWC has stated before, prioritization should be given to previously degraded and destroyed lands before compromising the untouched, pristine desert landscapes that contribute to the legacy of the Western Frontier!

In closing, we need to reiterate that we are highly supportive of renewable energy generation, specifically solar, in the California Desert. The current PEIS model, however, is not only unnecessary and irreversible; it is an irresponsible use of our public lands! There are diverse alternatives to consider, and later implement, to reach our renewable energy goals!

The fate of our precious land is entrusted to the DOI. We ask that you thoughtfully weigh the consequences of this decision. Thank you for the opportunity to provide insight and comment regarding the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States.

Sincerely,

April Sall
The Wildlands Conservancy, Conservation Director

Audubon California
California Native Plant Society * California Wilderness Coalition
Center for Biological Diversity * Defenders of Wildlife
Desert Protective Council * Mojave Desert Land Trust
National Parks Conservation Association
Natural Resources Defense Council * Sierra Club * The Nature Conservancy
The Wilderness Society * The Wildlands Conservancy

Renewable Siting Criteria for California Desert Conservation Area

Environmental stakeholders have been asked by land management agencies, elected officials, other decision-makers, and renewable energy proponents to provide criteria for use in identifying potential renewable energy sites in the California Desert Conservation Area (CDCA). Large parts of the California desert ecosystem have survived despite pressures from mining, grazing, ORV, real estate development and military uses over the last century. Now, utility scale renewable energy development presents the challenge of new land consumptive activities on a potentially unprecedented scale. Without careful planning, the surviving desert ecosystems may be further fragmented, degraded and lost.

The criteria below primarily address the siting of solar energy projects and would need to be further refined to address factors that are specific to the siting of wind and geothermal facilities. While the criteria listed below are not ranked, they are intended to inform planning processes and were designed to provide ecosystem level protection to the CDCA (including public, private and military lands) by giving preference to disturbed lands, steering development away from lands with high environmental values, and avoiding the deserts' undeveloped cores. They were developed with input from field scientists, land managers, and conservation professionals and fall into two categories: 1) areas to prioritize for siting and 2) high conflict areas. The criteria are intended to guide solar development to areas with comparatively low potential for conflict and controversy in an effort to help California meet its ambitious renewable energy goals in a timely manner.

Areas to Prioritize for Siting

- Lands that have been mechanically disturbed, i.e., locations that are degraded and disturbed by mechanical disturbance:
  - Lands that have been "type-converted" from native vegetation through plowing, bulldozing or other mechanical impact often in support of agriculture or other land cover change activities (mining, clearance for development, heavy off-road vehicle use).[1]
- Public lands of comparatively low resource value located adjacent to degraded and impacted private lands on the fringes of the CDCA:[2]
  - Allow for the expansion of renewable energy development onto private lands.
  - Private lands development offers tax benefits to local government.
- Brownfields:
  - Revitalize idle or underutilized industrialized sites.
  - Existing transmission capacity and infrastructure are typically in place.

- Locations adjacent to urbanized areas:[3]
    - Provide jobs for local residents often in underserved communities;
    - Minimize growth-inducing impacts;
    - Provide homes and services for the workforce that will be required at new energy facilities;
    - Minimize workforce commute and associated greenhouse gas emissions.
- Locations that minimize the need to build new roads.
- Locations that could be served by existing substations.
- Areas proximate to sources of municipal wastewater for use in cleaning.
- Locations proximate to load centers.
- Locations adjacent to federally designated corridors with existing major transmission lines.[4]

High Conflict Areas

In an effort to flag areas that will generate significant controversy the environmental community has developed the following list of criteria for areas to avoid in siting renewable projects. These criteria are fairly broad. They are intended to minimize resource conflicts and thereby help California meet its ambitious renewable goals. The criteria are not intended to serve as a substitute for project specific review. They do not include the categories of lands within the California desert that are off limits to all development by statute or policy.[5]

- Locations that support sensitive biological resources, including: federally designated and proposed critical habitat; significant[6] populations of federal or state threatened and endangered species,[7] significant populations of sensitive, rare and special status species,[8] and rare or unique plant communities.[9]
- Areas of Critical Environmental Concern, Wildlife Habitat Management Areas, proposed HCP and NCCP Conservation Reserves.[10]
- Lands purchased for conservation including those conveyed to the BLM.[11]
- Landscape-level biological linkage areas required for the continued functioning of biological and ecological processes.[12]
- Proposed Wilderness Areas, proposed National Monuments, and Citizens' Wilderness Inventory Areas.[13]
- Wetlands and riparian areas, including the upland habitat and groundwater resources required to protect the integrity of seeps, springs, streams or wetlands.[14]
- National Historic Register eligible sites and other known cultural resources.
- Locations directly adjacent to National or State Park units.[15]

EXPLANATIONS

[1] Some of these lands may be currently abandoned from those prior activities, allowing some natural vegetation to be sparsely re-established. However, because the desert is slow to heal, these lands do not support the high level of ecological functioning that undisturbed natural lands do.

[2] Based on currently available data.

[3] Urbanized areas include desert communities that welcome local industrial development but do not include communities that are dependent on tourism for their economic survival.

[4] The term "federally designated corridors" does not include contingent corridors.

[5] Lands where development is prohibited by statute or policy include but are not limited to:

National Park Service units; designated Wilderness Areas; Wilderness Study Areas; BLM National Conservation Areas; National Recreation Areas; National Monuments; private preserves and reserves; Inventoried Roadless Areas on USFS lands; National Historic and National Scenic Trails; National Wild, Scenic and Recreational Rivers; HCP and NCCP lands precluded from development; conservation mitigation banks under conservation easements approved by the state Department of Fish and Game, U.S. Fish and Wildlife Service or Army Corps of Engineers a; California State Wetlands; California State Parks; Department of Fish and Game Wildlife Areas and Ecological Reserves; National Historic Register sites.

[6] Determining "significance" requires consideration of factors that include population size and characteristics, linkage, and feasibility of mitigation.

[7] Some listed species have no designated critical habitat or occupy habitat outside of designated critical habitat. Locations with significant occurrences of federal or state threatened and endangered species should be avoided even if these locations are outside of designated critical habitat or conservation areas in order to minimize take and provide connectivity between critical habitat units.

[8] Significant populations/occurrences of sensitive, rare and special status species including CNPS list 1B and list 2 plants, and federal or state agency species of concern.

[9] Rare plant communities/assemblages include those defined by the California Native Plant Society's Rare Plant Communities Initiative and by federal, state and county agencies.

[10] ACECs include Desert Tortoise Desert Wildlife Management Areas (DWMAs). The CDCA Plan has designated specific Wildlife Habitat Management Areas (HMAs) to conserve habitat for species such as the Mohave ground squirrel and bighorn sheep. Some of these designated areas are subject to development caps which apply to renewable energy projects (as well as other activities).

[11] These lands include compensation lands purchased for mitigation by other parties and transferred to the BLM and compensation lands purchased directly by the BLM.

[12] Landscape-level linkages provide connectivity between species populations, wildlife movement corridors, ecological process corridors (e.g., sand movement corridors), and climate change adaptation corridors. They also provide connections between protected ecological reserves such as National Park units and Wilderness Areas. The long-term viability of existing populations within such reserves may be dependent upon habitat, populations or processes that extend outside of their boundaries. While it is possible to describe current wildlife movement corridors, the problem of forecasting the future locations of such corridors is confounded by the lack of certainty inherent in global climate change. Hence the need to maintain broad, landscape-level connections. To maintain ecological functions and natural history values inherent in parks, wilderness and other biological reserves, trans-boundary ecological processes must be identified and protected. Specific and cumulative impacts that may threaten vital corridors and trans-boundary processes should be avoided.

[13] Proposed Wilderness Areas: lands proposed by a member of Congress to be set aside to preserve wilderness values. The proposal must be: 1) introduced as legislation, or 2) announced by a member of Congress with publicly available maps. Proposed National Monuments: areas proposed by the President or a member of Congress to protect objects of historic or scientific interest. The proposal must be: 1) introduced as legislation or 2) announced by a member of Congress with publicly available maps. Citizens' Wilderness Inventory Areas: lands that have been inventoried by citizens groups, conservationists, and agencies and found to have defined "wilderness characteristics." The proposal has been publicly announced.

[14] The extent of upland habitat that needs to be protected is sensitive to site-specific resources. For example: the NECO Amendment to the CDCA Plan protects streams within a 5-mile radius of Townsend big-eared bat maternity roosts; aquatic and riparian species may be highly sensitive to changes in groundwater levels.

[15] Adjacent: lying contiguous, adjoining or within 2 miles of park or state boundaries. (Note: lands more than 2 miles from a park boundary should be evaluated for importance from a landscape-level linkage perspective, as further defined in footnote 12).

Thank you for your comment, Ken Goldsmith.

The comment tracking number that has been assigned to your comment is SolarD11776.

Comment Date: April 27, 2011 14:20:48PM
Solar Energy Development PEIS
Comment ID: SolarD11776

First Name: Ken
Middle Initial:
Last Name: Goldsmith
Organization:
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Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

IF amended, I strongly support the Solar Energy Zone alternative, which would concentrate solar development within parcels of land that avoid needless future conflicts with national park resources and sensitive desert ecology. However, several of the proposed Solar Energy Zones (SEZ) that threaten our national parks. I urge the following changes:

1. The Riverside East SEZ must be reconfigured to reduce impact to Joshua Tree National Park's wilderness and wildlife corridors.

2. The Iron Mountain SEZ must be removed to prevent impacts to Joshua Tree National Park’s remarkable scenery and wildlife.

3. The Amargosa Valley SEZ must be reduced or reconfigured to reduce negative impact to Death Valley's wilderness and precious water resources, including desert wetlands home to endangered species such as the Devil’s Hole Pupfish.

4. The Red Sands SEZ threatens water resources critical to wildlife and the formation of desert dunes at White Sands National Monument.

Any proposed solar projects sited within 15 miles of a national park boundary should trigger a consultation with the National Park Service to determine whether the project unacceptably impacts or diminishes national park resources or visitor enjoyment.

Finally, it is vital that the BLM include proposed national parks, wilderness areas, and national monuments as high conflict areas for industrial solar development.

Thank you for the opportunity to comment.

Thank you for your comment, Lahsha Brown.

The comment tracking number that has been assigned to your comment is SolarD11777.

Comment Date: April 27, 2011 14:23:00PM
Solar Energy Development PEIS
Comment ID: SolarD11777

First Name: Lahsha
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Attachment: 2011 4 18 FIF Comments on BLM Solar DPEIS.doc

Comment Submitted:

April 27th, 2011

Delivered via electronic submission to the BLM Solar PEIS website and U.S. mail.

Ms. Linda Resseguie, BLM Solar PEIS Project Lead
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Re: FIF Comments on Draft Programmatic Environmental Impact Statement for Solar Energy Development in Arizona

Dear Ms. Resseguie,

Friends of Ironwood Forest (FIF) is a 501c3 non-profit membership based organization working to permanently protect the biological, geological, archaeological, cultural and historical resources and values for which the Ironwood Forest National Monument was established in Pima and Pinal counties, Arizona. Our programs focus on accomplishing targeted conservation service projects, educating the public and Monument visitors about the natural and cultural resources, seeking out partnerships with other organizations, and serving as a strong advocate for protecting the Monument.

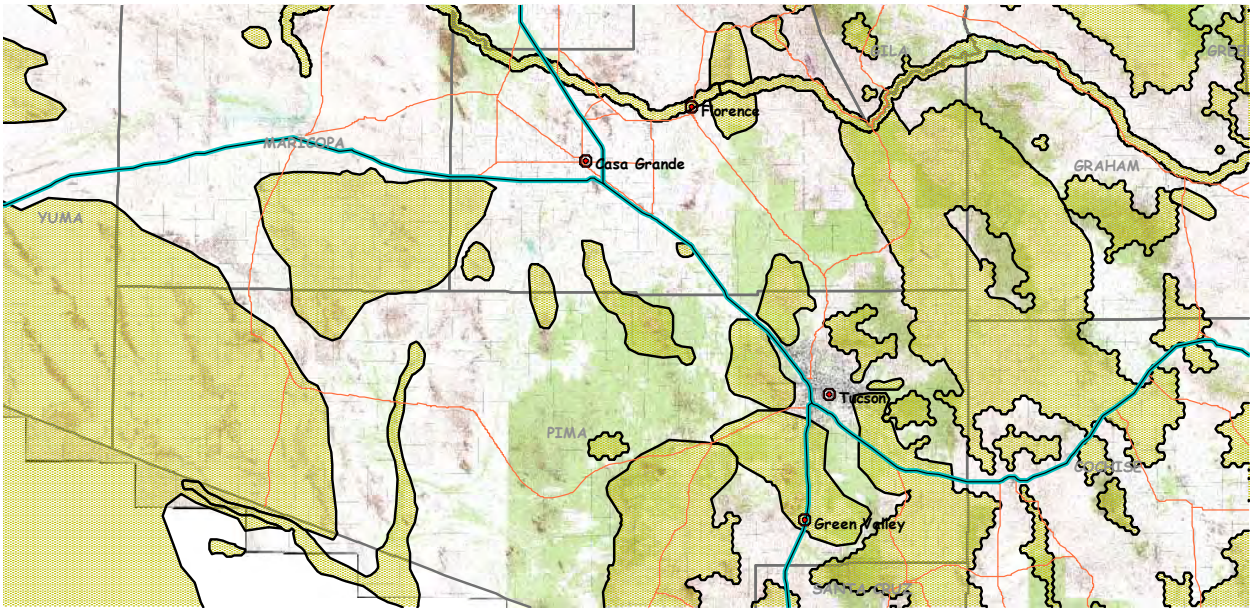
We appreciate the opportunity to comment on the draft Solar PEIS currently being considered. We would call to your attention the comments submitted by the National Trust for Historic Preservation and the environmental coalition led by the Wilderness Society *et al,* both of which we support.

The Arizona - Sonora Desert Museum has done a thorough assessment of the biologic resources of the Ironwood Forest National Monument including the iconic ironwood tree for which it was named. Our colleagues note in their comments that, while not a threatened or endangered species, each year the Sonoran Desert loses more of its old growth ironwood trees, which may live over 800 years. This species is listed on both the "Salvage Assessed" and "Harvest Restricted" lists in the Native Arizona Plant Law due to its high value. Mature ironwood trees appear in both washes and throughout the proposed solar development areas. These trees provide important habitat functions and increase the biological diversity of areas. They act as both "nurse plants" and keystone species that modify habitats and provide benefits to over 500 species of other plants and wildlife. If ironwoods were

eliminated from Sonoran Desert habitats, there would be a decrease in the density of associated plants and subsequently in associated local faunal communities. Ironwoods must be protected both to maintain the diversity and lushness of the Sonoran Desert communities they inhabit and to maintain the regeneration dynamics of species who utilize the canopy at some time in their life cycle. Protecting mature ironwood trees can help limit the impacts to wildlife as well as other plant species (http://www.desertmuseum.org/programs/ifnm_ironwoodtree.php).

We would specifically reiterate and request that the BLM exclude a small "b"-shaped parcel located adjacent to and immediately south and west of Ironwood Forest National Monument and northeast of the Tohono O'Odham Reservation, near Avra Valley Road/Silverbell Road loop, less than 20 miles west of I-10 between Tucson and Casa Grande. Any solar energy development on this extremely small parcel would undoubtedly have significant visual impacts on both the national monument and the Tohono O'Odham Nation, and potentially on traditional cultural properties. The same is true of the two parcels identified near the northern aspect of the monument: one parcel northwest of the very most northwestern part of the monument boundary in the Sawtooth Mountains and another parcel north of the "middle" of the monument, surrounded by state land. All three of these parcels can be seen in the Friends of Ironwood Forest's membership brochure and are important aspects of the experience and visual integrity of the Monument. The nearby Juan Bautista de Anza National Historic Trail Corridor and Auto Route may also be adversely impacted by development of parcels identified in this region. As well, The BLM should exclude the southern portion of the area southwest of the West Silver Bell Mountains, near the Aguirre Wash, around the former Spanish mission site, Santa Ana del Chiquiburitac, from solar energy development. The mission/visita was the last mission constructed in Primeria Alta in the late 1700's by Tohono O'Odham laborers for Spanish Franciscan friars**.** Very few Spanish mission sites are known from Arizona so this one is undoubtedly nationally and regionally significant.

In Pinal County's series of public open houses regarding their recent Comprehensive Plan update, maintenance of an east-west open space wildlife linkage and trails system, from the Sawtooth and Silverbell Mountains of the Ironwood Forest National Monument, across utility easements, railroad tracks, I-10, and the CAP canal, to the Tortolita Mountains and to the Picacho State Park and Mountains, was identified by citizens as a key component of the plan. Each of the aforementioned mountain ranges is listed as an "Area of High Biological Significance" on the Arizona State Mapguide (http://gis.pima.gov/maps/mapguide/mgmap.cfm?path=/maps/az/mapguide/arizona65.mwf&scriptpath=mgmapinitnullAPI.inc) – seen below.



Pinal County's Comprehensive Plan Open Space and Trails Master Plan figures present multiple conflicts with areas you are considering for potential solar development (http://pinalcountyaz.gov/Departments/DevelopmentServices/Documents/Downloads/FINAL%20Open%20Space%20and%20Trails%20Master%20Plan.pdf). Many of these BLM lands not currently within Ironwood Forest National Monument were originally submitted for inclusion and could be considered for inclusion if there is ever an expansion of the Monument. We would refer you specifically to the map of cultural resources (Figure 4, page 14) and associated text as well as the final master plan (Figure 13, page 42).

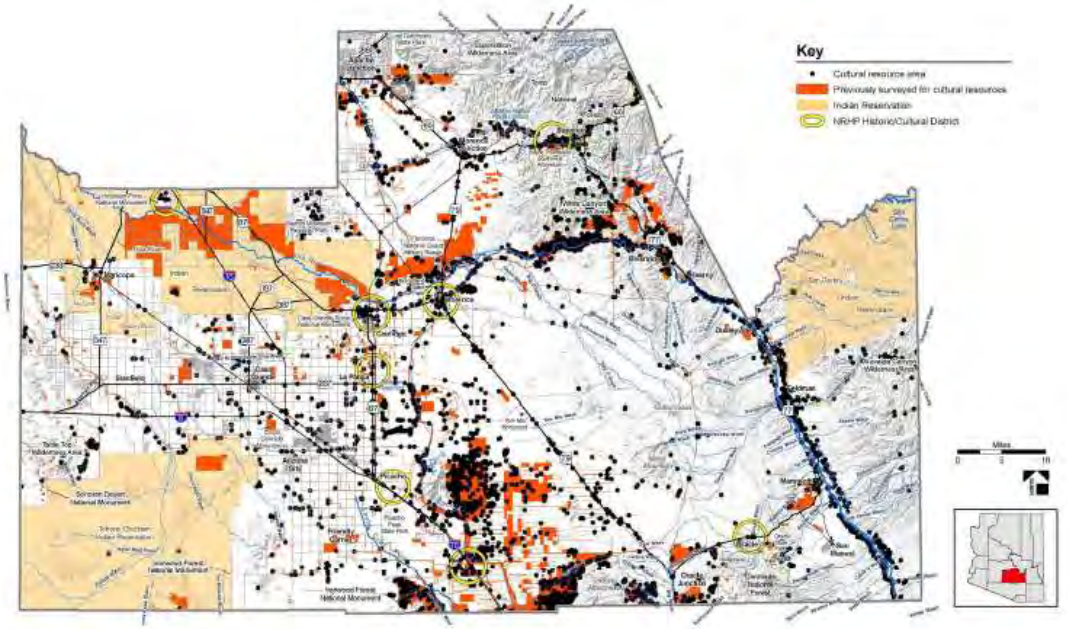


Figure 4. Cultural Resources

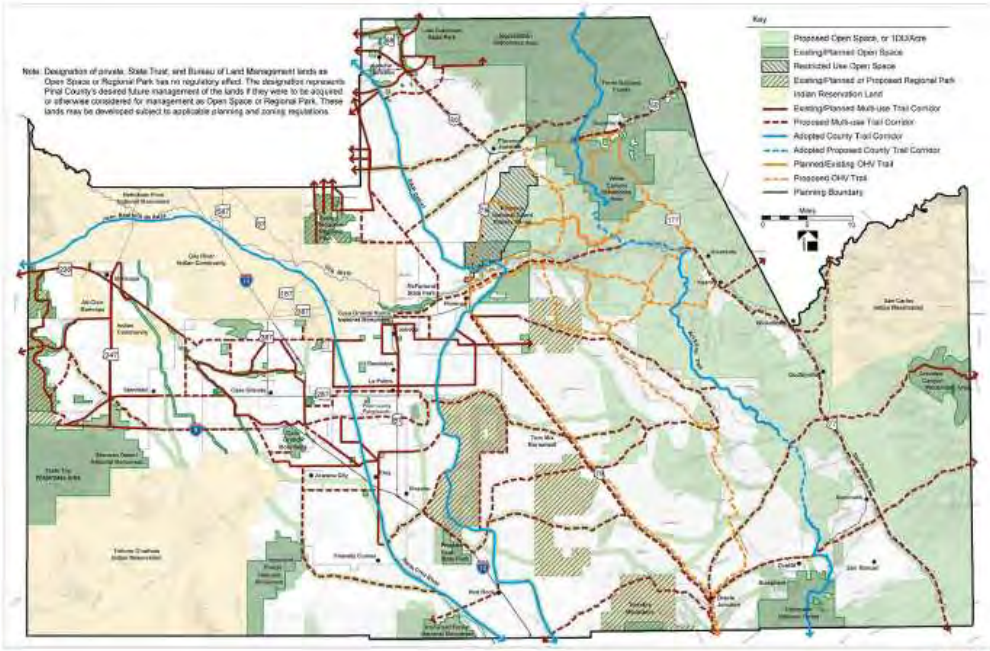


Figure 13. Final Master Plan Map

This region encompasses many wildlife linkages including the Ironwood - Tortolita Linkage # 79 of the statewide Arizona Wildlife Linkage Assessment (http://www2.azdot.gov/Highways/OES/AZ_WildLife_Linkages/assessment.asp), pages 95 & 96. This project was undertaken by over 9 different public agencies and non-profit organizations including federal and state agencies, experts, academics, and researchers and has identified potential linkages throughout the state. Focal species of concern analyzed were: Bighorn Sheep, Bobcat, Cactus Ferruginous Pygmy-owl, Cave Myotis, Javelina, Kit Fox, Mountain Lion, Mule Deer, Sonoran Desert Tortoise, and Western Burrowing Owl. Vegetative types identified were: 29% AZ Upland Sonoran Desertscrub and 71% Lower Colorado River Sonoran Desertscrub.

The Ironwood – Picacho Linkage was further researched for the Arizona Game and Fish Department by Dr Paul Beier *et al* of Northern Arizona University – please see Figure 1 (http://corridordesign.org/dl/linkages/reports/Ironwood-Picacho_LinkageDesign.pdf). Focal species of concern analyzed were: Badger, Black-tailed Jackrabbit, Desert Bighorn Sheep, Javelina, Mule Deer, Black-tailed Rattlesnake, Desert Tortoise, Sonoran Desert Toad, Sonoran Whipsnake, Tucson Shovel-nosed Snake, and Cactus Ferruginous Pygmy-owl. 92% of the landcover within the linkage design was composed of scrub – shrub, more specifically comprised of 30.7 % Creosotebush - White Bursage Desert Scrub, 60.7 % Palo Verde - Mixed Cacti Desert Scrub, 0.2% Mesquite Upland Scrub, and 0.4% Desert Scrub (misc). Our colleagues have submitted species specific comments we commend to your attention.

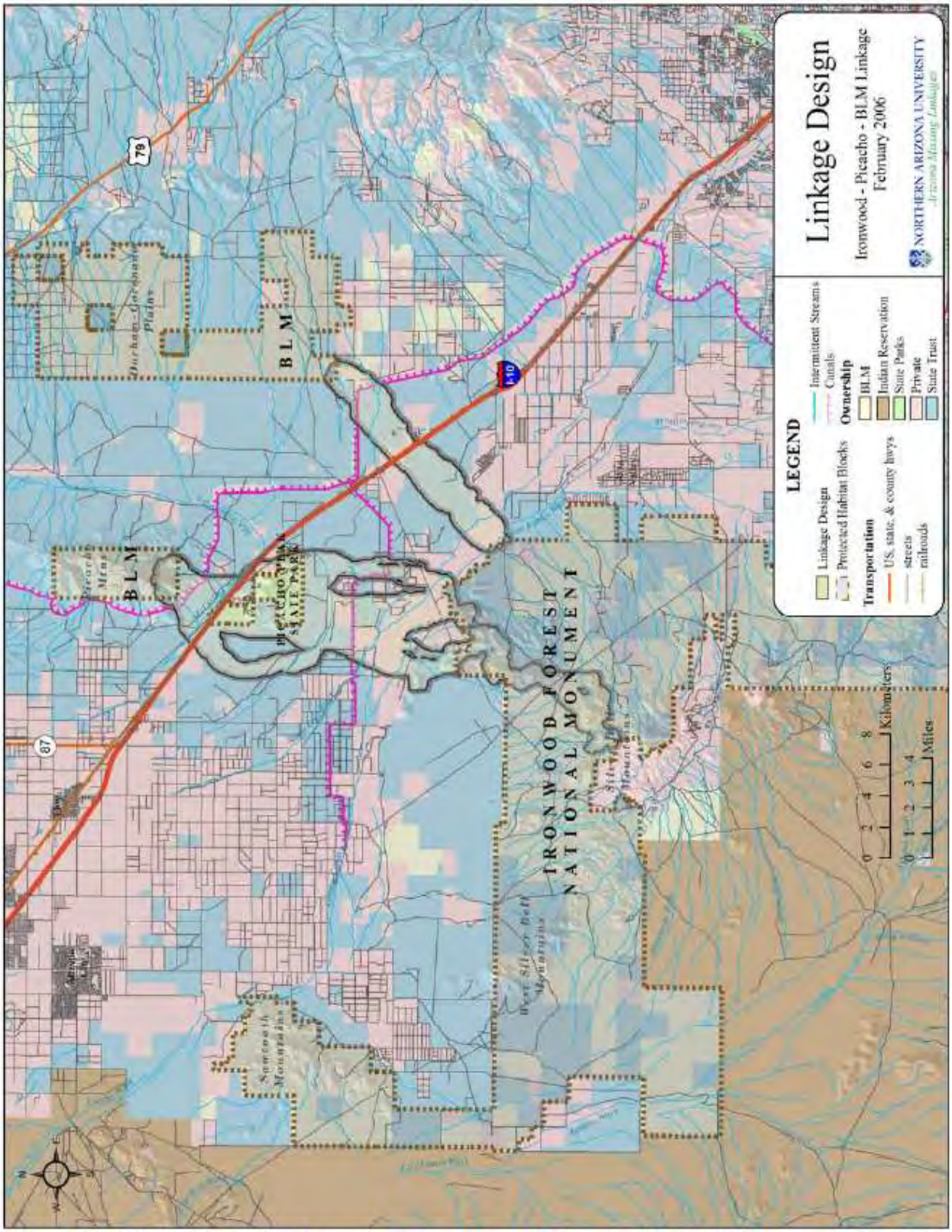
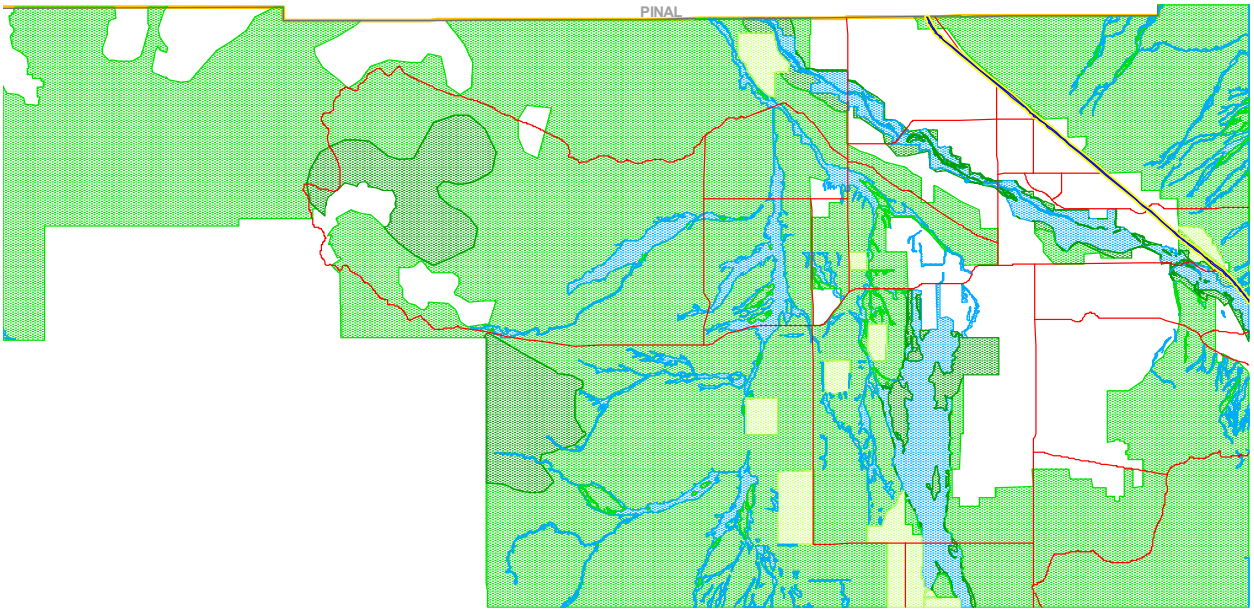


Figure 1: The Linkage Design has 2 strands: one connecting the Ironwood National Monument to the Picacho Mountains, and one connecting Ironwood National Monument to the BLM land labeled Durham-Coronado Plains.

We would reiterate: "Industrial-scale solar development in these linkages could result in their permanent impairment, fragmentation and loss of functionality for certain species…For public lands affected by the proposed action and alternatives in Arizona, we recommend that the Arizona Wildlife Linkages Assessment and subset of modeled multi-species linkages be utilized to identify areas of avoidance and/or mitigation… Prescriptions that intend to avoid impacts to migration corridors should apply to projects both inside and outside of SEZs. In addition, it's important to emphasize that issues around wildlife movement and habitat corridors are landscape-scale issues; they do not receive adequate consideration when approached at the scale of project-level permitting, and should instead be addressed at the scale of individual SEZ regions and beyond. Project-level efforts should then be tailored to be compatible with these landscape-scale migration corridor analyses."

The landscape level goals of both Pinal County's Open Space and Trails Master Plan and Pima County's national award winning Sonoran Desert Conservation Plan and pending Multi-species Habitat Conservation Plan application with the US Department of the Interior's Fish and Wildlife Service may be adversely impacted and demonstrate significant conflicts with areas you are considering for solar development (http://www.pima.gov/cmo/sdcp/) & (http://gis.pima.gov/maps/mapguide/mgmap.cfm?path=/gis/maps/mapguide/dotmap65.mwf&scriptpath=mgmapinitnullAPI.inc).



Direct, indirect and cumulative impacts of industrial development of many of the parcels BLM has haphazardly identified could be devastating to geologic, hydrologic, cultural, historic, and biologic resources and their functions in maintaining bio-diversity and resilience in the face of climate change. As a policy, BLM should not propose any parcel for consideration without first thoroughly surveying it

for cultural and historic significance as well as consulting with expert biologists in academia, AGFD, and the USFWS, regarding biologic resources and local jurisdictions regarding their land use planning processes.

Quoting the BLM website (http://www.blm.gov/wo/st/en/prog/blm_special_areas/NLCS.html), "the Bureau of Land Management's National Landscape Conservation System (NLCS) contains some of the West's most spectacular landscapes. It includes over 886 federally recognized areas and approximately 27 million acres of National Monuments, National Conservation Areas, Wilderness Areas, Wilderness Study Areas, Wild and Scenic Rivers, National Scenic and Historic Trails, and Conservation Lands...

…The NLCS also reveals and protects our cultural legacy. It safeguards American Indian cliff dwellings and cultural sites, and preserves the remaining traces of our Nation's historic trails and pathways. The mission of the National Landscape Conservation System is to conserve, protect, and restore these nationally significant landscapes that are recognized for their outstanding cultural, ecological, and scientific values.

The NLCS works to conserve the essential fabric of the West. NLCS areas are part of an active, vibrant landscape where people live, work and play. They offer exceptional opportunities for recreation, solitude, wildlife viewing, exploring history, scientific research, and a wide range of traditional uses.

These are places that spark the imagination. Their spacious beauty has drawn people to the West for generations. The NLCS sustains for the future - and for everyone - these remarkable *landscapes of the American spirit*."

We agree. It should be apparent that any placement of industrial alternative energy factories within these "landscapes of the American spirit" is contrary to the intent of their designation and would compromise the very values for which they are revered and held in trust for current and future generations.

Therefore, the Friends of Ironwood Forest find that the possibility that a solar industrial complex could be placed near or within view of the boundaries of the Ironwood Forest National Monument is clearly inappropriate, inconsistent, and should never be considered in any alternative proposed by the BLM or any branch of the US government.

Thank you for your careful consideration of our comments,

Lahsha Brown, Executive Director

Thank you for your comment, April Sall.

The comment tracking number that has been assigned to your comment is SolarD11778.

Comment Date: April 27, 2011 18:23:03PM
Solar Energy Development PEIS
Comment ID: SolarD11778

First Name: April
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Last Name: Sall
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Privacy Preference: Don't withhold name or address from public record
Attachment: Desert Siting Criteria Memo June 29_FINAL_SENT.pdf

Comment Submitted:

April 26, 2011

Delivered via electronic submission to the BLM Solar PEIS website (http://solareis.anl.gov) and U.S. mail.

Linda Resseguie, BLM Solar PEIS Project Lead
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue - EVS/240
Argonne, IL 60439

Re: Comments on Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear Ms. Resseguie:

Thank you for the opportunity to comment on the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (DPEIS). The Wildlands Conservancy (TWC) also signed on to a larger group of environmental comments but would like to submit the following comments specific to our organization and position. TWC is a 501c3 non-profit conservation organization with the dual mission to preserve the beauty and biodiversity of the earth and to fund outdoor education programs for the youth. TWC has preserved more land in California with private funds than any other conservation organization and owns the largest nonprofit preserve system in California (CA). TWC is an advocate for the preservation of the unique and sensitive lands of the Mojave Desert, and we request that the following comments be applied to the PEIS to maintain the conservation, historic, and recreation values of these public lands.

TWC is very supportive of responsible renewable energy and eliminating our dependence on fossil fuel energy sources and reducing our carbon footprint. TWC leads by example with point of use renewable energy. Our first preserve was established off-the-grid and self-sufficient in 1995. Since that time we have installed photovoltaic solar arrays or wind mills on the majority of our preserves. We feel it is imperative that the siting of renewable energy projects and the greening of California's energy supply be accomplished while protecting our treasured landscapes and fragile ecosystems. TWC also has a vested interest in the current renewable energy discussion and corresponding developments being proposed on federal lands within the California desert region.

TWC is passionate about land conservation and preserving functioning ecosystems and initiated the largest private land acquisition project in U.S. History, The Catellus Land Purchase. Determined to prevent one of the great deserts of the world from being severed by development TWC raised more than $45 million in private funds and gifted it to the American people. This gift was to ensure preservation of a 140-mile stretch of the Mojave Desert that includes a spectacular landscape of eroded granite mountains, seemingly endless valleys, heroic rock formations, cinder cones and sand dunes. The purchase of over 600,000 acres in the CA Desert connected Joshua Tree National Park to Mojave National Preserve with public conservation lands. These lands were gifted to the Department of Interior (DOI) for management with the understanding that they were purchased for conservation. President Bill Clinton, Vice President Al Gore, DOI Secretary Bruce Babbitt and BLM Director Tom Fry all praised and congratulated TWC on the conservation benefits of this legacy purchase. Just 4 years after the completion of the project, applications for industrial renewable energy development began to cover the CA Desert and threaten to undo this legacy conservation project.

The Department of the Interior and the Department of Energy created a 'land rush' in the CA desert beginning with the Energy Policy Act of 2005. Shortly afterward, BLM announced its goal to produce 15,000 megawatts of renewable energy on public lands by 2015. While we support the overall initiative to green America's energy supply, DOI and DOE did not create a framework and siting criteria to encourage responsible projects in the most appropriate locations and as a result a speculative rush followed. Economic incentives for industry were numerous including: the low cost of 'leasing' public lands for projects, government American Recovery and Reinvestment Act (ARRA) grants and guaranteed loans, 'fast-tracked project status, etc. By 2007 over 1.2 million acres of the California desert were under application for industrial development and many of those applications were in areas with highly sensitive resources and proposing inefficient or unproven technology. Frustrated desert residents and enthusiasts were assured by BLM that the PEIS would be a planning document that would designate the best places for solar development on public lands and so far the draft greatly missed that mark.

The Preferred Alternative (PA)

The current preferred alternative is not only an enormous step backwards in the progress toward the development of a responsible renewable energy program, but it would be a waste of resources to continue with the PEIS if that remains the preferred alternative (PA). If the DOI continues to propose the preferred alternative, the potential for solar on 22 million acres in the west, then the PEIS has become a mere smokescreen for a planning document and is not the comprehensive planning document mandated by National Environmental Protection Act (NEPA). This preferred alternative would essentially be continuing the current status quo of accepting and processing applications for development on most public lands (National Parks, Wilderness and other Congressional designations being the only exclusions from development), with no integration of the 2010 independent science report that recommends renewable energy development on disturbed and degraded lands and that wildlands ecosystems remain intact. Recent emerging studies dramatically elevate the value of the Mojave Desert as a carbon sequestration bank and put in question the public benefit and green-house gas results of utility scale renewable energy development on undisturbed lands in the Mojave.

DOI began the NEPA process with a scoping process in 2009 for designating solar enterprise zones (SEZ's) on approximately 350,000 + acres in the California Desert Conservation Area (CDCA). Now in the first draft of the PEIS DOI has changed to a PA that includes the SEZ's plus the additional 22 million acres in the western 6 states, which completely changes the original intent and objective of the initial scoping Notice of Intent and public comments. In addition, the inclusion of the 1.7 additional acres in CA covers many of the lands in the Catellus lands Purchase that were gifted for conservation and include the proposed Mojave Trails National Monument. Lastly, because the planning area has been increased by more than 6 times of the original project area, we recommend that the DOI by virtue of NEPA, redo the scoping process.

SEZ's

It is TWC's position that DOI should change the preferred alternative to the Solar Energy Zones (SEZ) alternative only (Alternative). Furthermore, the SEZ's still need to be reduced and revised (see our September 2009 comments) for solar energy development to provide for long-term conservation and ecosystem functioning within the California Desert Conservation Area (CDCA). Also the current draft does not account for how pending solar applications will be incorporated into the PEIS or potential zones etc. and thus how cumulative impacts will be assessed and minimized.

In an effort to facilitate the BLM's daunting task of identifying suitable public lands for solar development, a number of environmental organizations including TWC have worked together to develop a desert siting criteria memo specifically designed for use by the BLM in the California Desert Conservation Area (CDCA) back in 2008-9. Those criteria were intended to aid in identifying lands both within and outside the SESA's that are lower in environmental resources and sensitivity and thus, more appropriate for industrial development. In the recent draft of the PEIS DOI appears to have discounted those and all other conservation and science recommendations by not including the recommended alternative that utilizes disturbed and degraded lands and instead selecting the current PA. This siting criteria memo is attached again and should be revisited and utilized in the Solar PEIS and SEZ designation if DOI is going to uphold any of its conservation mission.

Summary

The current PA in the Draft Solar PEIS is detrimental to all of the conservation work that has been done in the western deserts and does not reflect any of the knowledge scientists and land managers have gained over recent decades in the fields of conservation biology and ecosystem management. The environmental community has tried to work diligently alongside BLM over the past 2 years to help identify disturbed and degraded lands, including public lands that would provide the least conflicts for development and minimize irreversible ecosystem damage to our fragile deserts. Unfortunately these efforts seem are absent in the current draft of the PEIS and PA.

In 2010 DOI approved several "fast-track" projects , several of them with severe environmental damage and costs and despite the information about numerous sensitive resources upon breaking ground, these projects have been allowed to continue on their previous requirements without any revisions or adjustments to project footprints, mitigation or overall approval. Also since 'The BLM will continue to process existing renewable energy applications both within and outside the solar energy study areas' development is continuing in a crude framework. The DPEIS does not address how these pending, nor future applications will be treated in relation to the SEZ's in CA.

There are many proposed uses, and much competition for, the public lands in the desert including, but not limited to conservation, recreation, mineral exploration, military expansion, and renewable energy. While these are not all exclusive uses, BLM is charged with making many of these management decisions and allocations. Therefore, with regard to renewable energy, DOI should thoroughly evaluate the use of already disturbed lands (both private and public), and local distributed RE generation such as solar PV on rooftops of commercial and residential buildings to incorporate many alternatives and solutions into America's energy model. As TWC has stated before, prioritization should be given to previously degraded and destroyed lands before compromising the untouched, pristine desert landscapes that contribute to the legacy of the Western Frontier.

In closing, we need to reiterate that we are highly supportive of renewable energy generation, specifically solar, in the California Desert. The current PEIS model, however, is not only unnecessary and irreversible; it is an irresponsible use of our public lands. There are diverse alternatives to consider, and later implement, to reach our renewable energy goals.

The fate of our precious land is entrusted to the DOI. We ask that you thoughtfully weigh the consequences of this decision. Thank you for the opportunity to provide insight and comment regarding the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States.

Sincerely,

April Sall
The Wildlands Conservancy, Conservation Director

Audubon California
California Native Plant Society * California Wilderness Coalition
Center for Biological Diversity * Defenders of Wildlife
Desert Protective Council * Mojave Desert Land Trust
National Parks Conservation Association
Natural Resources Defense Council * Sierra Club * The Nature Conservancy
The Wilderness Society * The Wildlands Conservancy

Renewable Siting Criteria for California Desert Conservation Area

Environmental stakeholders have been asked by land management agencies, elected officials, other decision-makers, and renewable energy proponents to provide criteria for use in identifying potential renewable energy sites in the California Desert Conservation Area (CDCA). Large parts of the California desert ecosystem have survived despite pressures from mining, grazing, ORV, real estate development and military uses over the last century. Now, utility scale renewable energy development presents the challenge of new land consumptive activities on a potentially unprecedented scale. Without careful planning, the surviving desert ecosystems may be further fragmented, degraded and lost.

The criteria below primarily address the siting of solar energy projects and would need to be further refined to address factors that are specific to the siting of wind and geothermal facilities. While the criteria listed below are not ranked, they are intended to inform planning processes and were designed to provide ecosystem level protection to the CDCA (including public, private and military lands) by giving preference to disturbed lands, steering development away from lands with high environmental values, and avoiding the deserts' undeveloped cores. They were developed with input from field scientists, land managers, and conservation professionals and fall into two categories: 1) areas to prioritize for siting and 2) high conflict areas. The criteria are intended to guide solar development to areas with comparatively low potential for conflict and controversy in an effort to help California meet its ambitious renewable energy goals in a timely manner.

Areas to Prioritize for Siting

- Lands that have been mechanically disturbed, i.e., locations that are degraded and disturbed by mechanical disturbance:
  - Lands that have been "type-converted" from native vegetation through plowing, bulldozing or other mechanical impact often in support of agriculture or other land cover change activities (mining, clearance for development, heavy off-road vehicle use).[1]
- Public lands of comparatively low resource value located adjacent to degraded and impacted private lands on the fringes of the CDCA:[2]
  - Allow for the expansion of renewable energy development onto private lands.
  - Private lands development offers tax benefits to local government.
- Brownfields:
  - Revitalize idle or underutilized industrialized sites.
  - Existing transmission capacity and infrastructure are typically in place.

- Locations adjacent to urbanized areas:[3]
    - Provide jobs for local residents often in underserved communities;
    - Minimize growth-inducing impacts;
    - Provide homes and services for the workforce that will be required at new energy facilities;
    - Minimize workforce commute and associated greenhouse gas emissions.
- Locations that minimize the need to build new roads.
- Locations that could be served by existing substations.
- Areas proximate to sources of municipal wastewater for use in cleaning.
- Locations proximate to load centers.
- Locations adjacent to federally designated corridors with existing major transmission lines.[4]

High Conflict Areas

In an effort to flag areas that will generate significant controversy the environmental community has developed the following list of criteria for areas to avoid in siting renewable projects. These criteria are fairly broad. They are intended to minimize resource conflicts and thereby help California meet its ambitious renewable goals. The criteria are not intended to serve as a substitute for project specific review. They do not include the categories of lands within the California desert that are off limits to all development by statute or policy.[5]

- Locations that support sensitive biological resources, including: federally designated and proposed critical habitat; significant[6] populations of federal or state threatened and endangered species,[7] significant populations of sensitive, rare and special status species,[8] and rare or unique plant communities.[9]
- Areas of Critical Environmental Concern, Wildlife Habitat Management Areas, proposed HCP and NCCP Conservation Reserves.[10]
- Lands purchased for conservation including those conveyed to the BLM.[11]
- Landscape-level biological linkage areas required for the continued functioning of biological and ecological processes.[12]
- Proposed Wilderness Areas, proposed National Monuments, and Citizens' Wilderness Inventory Areas.[13]
- Wetlands and riparian areas, including the upland habitat and groundwater resources required to protect the integrity of seeps, springs, streams or wetlands.[14]
- National Historic Register eligible sites and other known cultural resources.
- Locations directly adjacent to National or State Park units.[15]

EXPLANATIONS

[1] Some of these lands may be currently abandoned from those prior activities, allowing some natural vegetation to be sparsely re-established. However, because the desert is slow to heal, these lands do not support the high level of ecological functioning that undisturbed natural lands do.

[2] Based on currently available data.

[3] Urbanized areas include desert communities that welcome local industrial development but do not include communities that are dependent on tourism for their economic survival.

[4] The term "federally designated corridors" does not include contingent corridors.

[5] Lands where development is prohibited by statute or policy include but are not limited to:

National Park Service units; designated Wilderness Areas; Wilderness Study Areas; BLM National Conservation Areas; National Recreation Areas; National Monuments; private preserves and reserves; Inventoried Roadless Areas on USFS lands; National Historic and National Scenic Trails; National Wild, Scenic and Recreational Rivers; HCP and NCCP lands precluded from development; conservation mitigation banks under conservation easements approved by the state Department of Fish and Game, U.S. Fish and Wildlife Service or Army Corps of Engineers a; California State Wetlands; California State Parks; Department of Fish and Game Wildlife Areas and Ecological Reserves; National Historic Register sites.

[6] Determining "significance" requires consideration of factors that include population size and characteristics, linkage, and feasibility of mitigation.

[7] Some listed species have no designated critical habitat or occupy habitat outside of designated critical habitat. Locations with significant occurrences of federal or state threatened and endangered species should be avoided even if these locations are outside of designated critical habitat or conservation areas in order to minimize take and provide connectivity between critical habitat units.

[8] Significant populations/occurrences of sensitive, rare and special status species including CNPS list 1B and list 2 plants, and federal or state agency species of concern.

[9] Rare plant communities/assemblages include those defined by the California Native Plant Society's Rare Plant Communities Initiative and by federal, state and county agencies.

[10] ACECs include Desert Tortoise Desert Wildlife Management Areas (DWMAs). The CDCA Plan has designated specific Wildlife Habitat Management Areas (HMAs) to conserve habitat for species such as the Mohave ground squirrel and bighorn sheep. Some of these designated areas are subject to development caps which apply to renewable energy projects (as well as other activities).

[11] These lands include compensation lands purchased for mitigation by other parties and transferred to the BLM and compensation lands purchased directly by the BLM.

[12] Landscape-level linkages provide connectivity between species populations, wildlife movement corridors, ecological process corridors (e.g., sand movement corridors), and climate change adaptation corridors. They also provide connections between protected ecological reserves such as National Park units and Wilderness Areas. The long-term viability of existing populations within such reserves may be dependent upon habitat, populations or processes that extend outside of their boundaries. While it is possible to describe current wildlife movement corridors, the problem of forecasting the future locations of such corridors is confounded by the lack of certainty inherent in global climate change. Hence the need to maintain broad, landscape-level connections. To maintain ecological functions and natural history values inherent in parks, wilderness and other biological reserves, trans-boundary ecological processes must be identified and protected. Specific and cumulative impacts that may threaten vital corridors and trans-boundary processes should be avoided.

[13] Proposed Wilderness Areas: lands proposed by a member of Congress to be set aside to preserve wilderness values. The proposal must be: 1) introduced as legislation, or 2) announced by a member of Congress with publicly available maps. Proposed National Monuments: areas proposed by the President or a member of Congress to protect objects of historic or scientific interest. The proposal must be: 1) introduced as legislation or 2) announced by a member of Congress with publicly available maps. Citizens' Wilderness Inventory Areas: lands that have been inventoried by citizens groups, conservationists, and agencies and found to have defined "wilderness characteristics." The proposal has been publicly announced.

[14] The extent of upland habitat that needs to be protected is sensitive to site-specific resources. For example: the NECO Amendment to the CDCA Plan protects streams within a 5-mile radius of Townsend big-eared bat maternity roosts; aquatic and riparian species may be highly sensitive to changes in groundwater levels.

[15] Adjacent: lying contiguous, adjoining or within 2 miles of park or state boundaries. (Note: lands more than 2 miles from a park boundary should be evaluated for importance from a landscape-level linkage perspective, as further defined in footnote 12).

Thank you for your comment, Cory Lytle.

The comment tracking number that has been assigned to your comment is SolarD11779.

Comment Date: April 28, 2011 13:35:23PM
Solar Energy Development PEIS
Comment ID: SolarD11779

First Name: Cory
Middle Initial:
Last Name: Lytle
Organization: Lincoln County NV- Planning Department
Address: PO Box 329
Address 2:
Address 3:
City: Pioche
State: NV
Zip: 89043
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Lincoln County NV Planning Department Solar PEIS comment letter 4-28-11.pdf

Comment Submitted:

Lincoln County Planning Department
Post Office Box 329
Pioche, Nevada 89043

Phone 775 962 5345 Fax 775 962 5347

April 12, 2011

Solar Energy Draft Programmatic EIS
Attn: Ms. Heidi M. Hartmann, Document Manager
Argonne National Laboratory
9700 Cass Avenue – EVS/240
Argonne, Illinois 60439

RE: Comments to Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear Ms. Hartmann:

The Lincoln County Planning Department (Department) appreciates this opportunity to provide Public Scoping comment on the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States.

General Comments

General Comment 1. The Lincoln County Planning Department (Department) **supports** the "Solar Energy Zone Program Alternative" (SEZ Program) and **opposes** the "Solar Energy Development Program Alternative" (preferred alternative) for reasons and criteria listed below.

Many local stakeholders and agency representatives have previously identified lands in Lincoln County that meet suitability requirements for solar energy development. These lands also meet the criteria of "low potential for conflict" found in IM 2011-16.

The SEZ Program Alternative will limit the exorbitant amount of time, money and energy (on behalf of the energy developer, Lincoln County, local and regional stakeholders, State and Federal agencies) that goes into making sure that solar development rights-of-way are "smart from the start" and sited in appropriate locations.

General Comment 2. In terms of total proposed and feasible acreage, the Department **does not** support SEZ designation and solar energy development in excess of the capacity of existing and/or reasonably foreseeable power transmission facilities. In terms of location, these would be the utility corridors located throughout Lincoln County and designated by the LCCRDA and the SWIP. SEZ designations should be limited in size to reasonably foreseeable line capacity in which the generated electricity can be transported.

Given the current and proposed transmission line capability located within Dry Lake Valley and Delamar Valley, the "reasonable and foreseeable" total transmission capacity will not exceed 2000 MW. This is primarily because of line length and other pertinent factors. One must remember the 2000 MW rating represents total transmission capability. If a generous assumption of 50% of the line capacity is that of solar energy and the calculated solar energy production of 9 acres per MW is utilized, the total acreage that should be designated as a SEZ in Lincoln County **should not** exceed 9,000 – 10,000 acres total. Again these figures are estimations, albeit generous.

Therefore, the Department strongly recommends that the Final PEIS and any related Record of Decision identify no more than 10,000 acres of BLM-administered lands be identified for SEZ designation in Lincoln County.

General Comment 3. The Department, the Board of Lincoln County Commissioners, and local stakeholders have identified a portion of the Ely Springs Cattle Allotment located within the proposed Dry Lake Valley North SEZ that is very suitable for solar energy development. In addition, the owner of the grazing permit for the Ely Springs Cattle Allotment supports solar development within the allotment and the owner's adjacent private land.

The Department emphasizes that solar energy development on BLM administered land should be implemented in a manner that is "smart from the start." The development should be designed relevant to transmission capability, located in areas that avoid and minimize impacts to other beneficial multiple use and beneficial natural and cultural resources, and at the same time compliment local economics and bolster our energy portfolio. The location in Lincoln County described above embraces all of these "smart from the start" principles.

The Ely Springs Cattle Allotment within the Dry Lake Valley North SEZ is also very practically situated in terms of addressing issues such as transportation management, potential transmission line "tie-in", and waste generation management. From a development standpoint, this area provides an effective clustering of solar potential. Locating centralized development of solar in this area provides for efficient and economical long-term operation and maintenance. In addition, the potential remains for several small or medium-scale developments to co-locate grid tie-in capabilities. This of course, is a critical aspect of solar development that is very costly.

General Comment 4. The Department strongly recommends that the Final PEIS and any related Record of Decision classify the remaining acreage within the proposed Dry Lake North SEZ as "lands excluded from utility-scale solar energy development." Solar development on remaining acreage within the proposed Dry Lake North SEZ does not "minimize adverse impacts to other resources" including, but not limited to: water resources, soil resources, vegetation resources, visual resources, recreation, livestock grazing, wildlife and county socioeconomics. Solar development in the remaining portion of the proposed Dry Lake Valley North SEZ would have unacceptable impacts to the above listed resources.

General Comment 5. The Department strongly recommends that the Final PEIS and any related Record of Decision classify the entire proposed Delamar Valley SEZ as "lands excluded from utility-scale solar energy development". The proposed Delamar Valley SEZ does not "minimize adverse impacts to other resources" including, but not limited to: water resources, soil resources, vegetation resources, visual resources, recreation, livestock grazing,

wildlife and county socioeconomics. Solar development in any portion of the proposed Delamar Valley SEZ would have unacceptable impacts to the above listed resources.

General Comment 6. The Department strongly recommends that the Final PEIS and any related Record of Decision classify the entire proposed East Mormon Mountain SEZ as "lands excluded from utility-scale solar energy development". The proposed East Mormon Mountain SEZ does not "minimize adverse impacts to other resources" including, but not limited to: water resources, soil resources, vegetation resources, visual resources, recreation, livestock grazing, wildlife and county socioeconomics. Solar development in any portion of the proposed East Mormon Mountain SEZ would have unacceptable impacts to the above listed resources.

Specific Comments

Attachment A contains the Lincoln County Planning Department comments to specific chapters and sections of the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States.

IN SUMMARY

The BLM Ely District Record of Decision and Approved Resource Management Plan 2008 states the following: **"Goals – Renewable Energy: Provide opportunities for development of renewable energy sources such as wind, solar, biomass and other alternative energy sources while minimizing adverse impacts to other resources."**; p. 73; (BLM/NV/EL/PL-GI08/25+1793)

The Lincoln County Public Lands Policy Plan 2010, Section 20 – Energy Development, states the following:

Policy 20-1:

> The development and coordinated "siting" of renewable, alternative, and traditional energy generation and transmission is encouraged. Coordinated planning is needed to integrate related Federal, State, and local planning documents and processes and expedite the permitting and evaluations needed for project approvals. This planning and coordination should occur at the project scoping phase or other preliminary process.

Policy 20-2:

> Renewable and alternative energy should be a priority and utilized in a manner that compliments other environmental resources and considers cumulative effects in a given area. Efforts should be undertaken to ensure a balance between renewable energy development and the protection of other resources that make the County attractive to residents and visitors.

Policy 20-3:

> Areas that have been identified which contain valuable high concentrations of natural and/or cultural resources within the County by the PLUAC, Lincoln County Planning Department, and Board of Lincoln County Commissioners, should be restricted from commercial energy development.

The Lincoln County Planning Department strongly recommends the following:

1) Support the "Solar Energy Zone Program Alternative" (SEZ Program) and **oppose** the "Solar Energy Development Program Alternative" (preferred alternative).
2) Support solar development on **10,000 acres within the Ely Springs Cattle Allotment.** This allotment is located in the proposed Dry Lake Valley North SEZ.
3) Support classifying the remaining acreage within the proposed Dry Lake North SEZ as "lands excluded from utility-scale solar energy development." (approx. 66,000 acres)
4) Support classifying the entire proposed Delamar Valley SEZ as "lands excluded from utility-scale solar energy development." (approx. 16,000 acres)
5) Support classifying the entire proposed East Mormon Mountain SEZ as "lands excluded from utility-scale solar energy development." (approx. 9,000 acres)

The Lincoln County Planning Department maintains the items listed above represent the most feasible and sustainable alternatives for solar development in Lincoln County from both a local standpoint and that of a potential developer. The acreage supported by the Department directly coincides with the "potential" availability and reasonable foreseeable ability to transport energy that is produced.

The acreage supported by the Lincoln County Planning Department also avoids and/or minimizes impacts to other beneficial multiple use and beneficial natural and cultural resources. Maintaining a "smart from the start" approach to this process will yield positive and sustainable results for all who are involved.

The acreage supported by the Lincoln County Planning Department should have no impact on the overall feasibility of solar energy production within Lincoln County, nor should it encumber the renewable energy goals of the State of Nevada or the current Federal Administration.

The Lincoln County Planning Department looks forward to working with BLM, DOE, Argonne National Laboratory and their staffs in preparing a Final PEIS which facilitates utility-scale solar energy development on BLM-administered lands. Lincoln County supports solar development in the right location and logistical method. Proper planning and coordination with local entities at the scoping phase will avoid or minimizes impacts to other multiple uses and beneficial resources that are critical to our county.

Please feel free to contact the Lincoln County Planning Department with questions or concerns.

Sincerely,

Cory Lytle
Lincoln County Planning Department

Thank you for your comment, claudia sall.

The comment tracking number that has been assigned to your comment is SolarD11780.

Comment Date: April 28, 2011 14:20:09PM
Solar Energy Development PEIS
Comment ID: SolarD11780

First Name: claudia
Middle Initial:
Last Name: sall
Organization: california desert coalition
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment: BLM_Solar DPEIS_Comments_CDC-final_28April2011_cs[1].pdf

Comment Submitted:

I am submitting a 2-page comment letter from California Desert Coalition. The file format is pdf

CALIFORNIA DESERT COALITION
P.O. Box 1508
Yucca Valley, CA 92286
www.CaDesertCo.org

April 28, 2011

Linda Resseguie, BLM Solar PEIS Project Lead
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Ave. - EVS/900
Argonne IL 60439

RE: Comments on Draft Programmatic EIS (DPEIS): Solar Energy Study Area

Dear Ms Resseguie:

The California Desert Coalition (CDC) provided scoping comments for the Solar Energy Development Programmatic EIS in September 2009 and is pleased to provide comments on the Draft Programmatic EIS: Solar Energy Study Area.

CDC is a citizens' advocacy group formed in 2007 to oppose the Los Angeles Department of Water & Power's (LADWP's) preferred alignment for its Green Path North transmission line project. Although the LADWP withdrew from Bureau of Land Management (BLM) its application for the Green Path North transmission line, CDC on behalf of the public continues to participate in the monitoring of renewable energy development in the California desert.

Scoping Comments

Despite our work and the extensive contributions from other public benefit organizations, we are disappointed that none of our scoping comments and recommendations has been incorporated in the DPEIS, specifically:

1. Existing Solar Applications be Disallowed outside of SESA's
2. Proposal for a Disturbed Lands Alternative.
3. Elimination of the need for the designation of additional transmission corridors by siting SESA's near existing roads and existing transmission line routes.

In our scoping comments, we noted that SESA's will not contribute to Energy Policy Act of 2005, do not comply with Goal #2 of the Department of Energy (DOE) plan favoring distributed energy, and that the Energy Policy Act of 2005 has suggested but not mandated that BLM produce renewable energy quotas on public lands. DOE, however, does offer a model on siting of renewable energy project in disturbed lands when it states that "PV when built in brownfields . . . could supply the nation with 90% of its power".

Lands being Proposed for Solar Development

When CDC provided scoping comments for the solar PEIS, the planning area was described by Department of Interior (DOI) was about 350,000 acres of SESA's in the Pisgah, Iron Mountain, Riverside East, and Imperial East. Only 18 months later, a new proposed preferred alternative (PA) has appeared with a DPEIS planning area that has dramatically exploded into an area six

times the original size, now an additional 22 million acres. What has caused this trice doubling appears to have happened as an internal document within the Department without the guiding benefit of the public scoping process and outside of public scrutiny. The public was not prepared in the scoping process for this unexpected alternative, nor was it the intent of the PEIS which was to direct how solar development on public lands was to proceed. Although the public widely participated in providing comments, the introduction of the PA is evidence that the exchange of information from BLM was not reciprocal. Now the previous scoping comment process is not adequate for or relevant to this new PA with its grossly expanded planning area. This PA must be taken off the table; otherwise, the scoping process per NEPA requirements must be repeated.

In the scoping process, many, many voices articulated that a Disturbed Lands Alternative should be included as an alternative. This alternative is markedly absent in the DPEIS. In its place is the bloated PA. In addition lands in the SESA's have since the scoping period been proposed for wilderness protection: no recognition has been given to their impending revised status and no SESA's have been modified or eliminated. For the reasons cited by The Wildlands Conservancy, we recommend that:

- □ Iron Mountain SESA be eliminated
- □ Pisgah SESA be significantly reduced or eliminated
- □ Riverside East be eliminated
- □ Imperial East SESA been reduced to avoid the cited impacts

Emerging Science in the Mojave Desert

In the fall of 2010, a panel of independent science advisors prepared a detailed report to the BLM, California Energy Commission, and state and federal wildlife agencies for the constructing and managing of renewable energy projects. The scientists said that undisturbed open spaces and important wildlife habitat should not be permanently sacrificed when other alternatives exists, i.e. big solar, wind and other energy projects should be built on "disturbed land" such as denuded former farms or on the land along roads, canals and power lines. They outlined specific principles for siting and designing renewable energy projects and principles for mitigation. If the Department and the Bureau had consulted with the independent science panel, certainly their findings would have been different than to create a design model that added substantially more undisturbed lands rather than modifying the original model presented to the public for review by providing a disturbed land alternative. Despite available resources, clearly DOI has chosen to leave out current science wisdom in the DPEIS.

In addition to this report are emerging scientific studies that point to the potential importance of carbon storage in deserts. Concern is expressed that where caliche (calcium carbonate) has developed, removing native vegetation, disturbing the soil surface and especially wetting the soils could add up to a release of that stored carbon in the caliche. This then clouds the certainty that a given solar array will end up really saving carbon or result in carbon releases that exceed their savings.

We call upon the DOI to draw on this science that supports the Disturbed Land Alternative and that also recommends against the preferred alternative (PA) that would develop more than 22 million acres of undisturbed, carbon-storing desert land.

Revisit to 1980 CDCP

The present DPEIS with its Proposed PA is a piecemeal planning process prejudiced to favor utility scale development of renewable energy instead of an impartial analysis of that

development. As evidence by the recent postponement at Ivanpah, resource values have taken second seat to energy development, and there was a failure to complete adequate biological surveys and a failure to analyze impacts. This expedited approach in this case compromised resource values and is the same approach taken in the DPEIS where the planning has become piecemeal rather than comprehensive as mandated by NEPA. In general, the deficiencies are so numerous in the DPEIS, that we recommend that the DPEIS be scrapped altogether, and perhaps use the existing CDCP as a the planning document for renewable energy

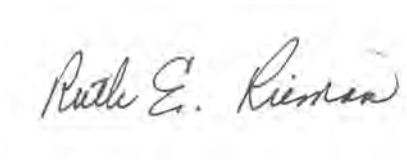
Conclusion

From the start, the DPEIS focus has been narrow rather than broad. It dismisses alternatives like distributed energy, conservation, and disturbed lands and is prejudiced to accommodating utility size scale development on undisturbed public lands. It has ignored direction from DOE regarding development of renewable energy on "brownfields" and not employed the scientific study developed specifically for DOI/BLM use that would direct them to already disturbed lands and to lands that would produce distributed energy. Sadly, we conclude that the siting of renewable energy has been more of a political football that a decision vetted by NEPA requirements and in the best interests of the public good. The failure of the Department to adequately provide siting criteria for renewable energy leaves the public with no alternative than to litigate the final EIS document and that failure will compound into delaying the process that will yield direly needed benefits of renewable energy for the American people.

NEPA requires BLM to consider a broad range of alternatives and BLM has failed to do that. Despite all the scoping comments given to provide guidance on the DPEIS, BLM has failed to use that information. Science has recommended a Disturbed Lands Alternative and BLM has failed to hear that recommendation. Instead, BLM has come up with a surprising, internally produced preferred alternative that neither serves the public nor effectively manages our public lands. This DPEIS is fundamentally flawed and the NEPA process must be re-started.

We continue to participate in the effort to protect the future of our citizens and their environment, the California Desert, and will be pleased to know that our efforts have been regarded and our work reviewed.

Sincerely,



Ruth E. Rieman, Vice Chair
California Desert Coalition

Thank you for your comment

The comment tracking number that has been assigned to your comment is SolarD11781.

Comment Date: April 28, 2011 16:00:24PM
Solar Energy Development PEIS
Comment ID: SolarD11781

First Name: [Withheld by requestor]
Middle Initial: [Withheld by requestor]
Last Name: [Withheld by requestor]
Organization:
Address:
Address 2:
Address 3:
City:
State:
Zip:
Country:
Privacy Preference: Withhold name and address from public record
Attachment: To Whom It May Concern.doc

Comment Submitted:

To Whom It May Concern:

In the summer of 1992, I moved from Los Angeles, CA to The Coachella Valley, I was only five at the time. I grew up here in Eastern Riverside County and came to love it and all it has to offer. Although it doesn't have the amusement parks, grand concert venues, or beaches that Los Angeles has to offer but it offers other things like the nature. Here in the desert we can go hiking, camping or even have nature walks; can you honestly do that in the city? You can take a walk outside and enjoy the nice, fresh, unpolluted air and clear blue skies. At night you are able to take a walk outside and go stargazing. You can go to the Natural Museum and see all the animals. Only putting these solar units in will greater damage our community and our history. Our precious animals will become extinct and our desert will no longer be as it once was. People from all over the world come to our desert to relax and see what this environment has to offer. Most of those tourists come down to hike in the mountains, or to go horseback riding. I have come to love the desert and its sense of calm. It would be detrimental if you destroyed that.

Thank you,

Arlene Arvizu

Thank you for your comment, Raymond Hiemstra.

The comment tracking number that has been assigned to your comment is SolarD11782.

Comment Date: April 28, 2011 17:32:45PM
Solar Energy Development PEIS
Comment ID: SolarD11782

First Name: Raymond
Middle Initial:
Last Name: Hiemstra
Organization:
Address: 214 19th st #5
Address 2:
Address 3:
City: Huntington Beach
State: CA
Zip: 92648
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

As a property owner in the California desert and a taxpayer concerned about government subsidies to private companies I respectfully submit the following comments.
1. There is plenty of privately owned land available for these projects to be located on. This property, which is often already disturbed, can be purchased at reasonable market rates. I oppose subsidizing these or any other energy projects with the gift of free public land. This warps the true cost of developing the energy source and robs private property owners of a potential source of income. These projects need to be able to stand on their own economically.
2. I am specifically opposed to the construction of concentrated solar projects that require cooling water. It is no secret that water is in short supply in the desert and that there will be serious negative impacts to plants and wildlife throughout the area due to the lowering of the water table. The result will be that the power plants will dry up springs and reduce the availability of water for vegetation. Only photovoltaic based technology should be used in the desert, if any is used at all.
3. Common sense tells us that regardless of any agreements to restore the desert land used for solar projects these lands will be permanently altered and unable to function as it did before development. The first priority for sighting of solar project should be the rooftops of urban areas using photovoltaic cells. Secondarily, private property should be used, and thirdly, previously disturbed desert land should be used. The use of undisturbed desert land should only be used as a last resort and then only at a high cost to compensate the taxpayers for the loss of the valuable function of this land for wildlife and recreation.

In closing, it is my opinion that the use of desert lands for concentrated solar projects at this time is premature and unnecessarily destructive. Urban solar should be the focus of any government subsided solar efforts with desert solar pursued only after significant advances in technology allow for a smaller footprint and less impact of the desert environment.

Thank you for considering my comments

Thank you for your comment

The comment tracking number that has been assigned to your comment is SolarD11783.

Comment Date: April 28, 2011 19:41:46PM
Solar Energy Development PEIS
Comment ID: SolarD11783

First Name: [Withheld by requestor]
Middle Initial: [Withheld by requestor]
Last Name: [Withheld by requestor]
Organization:
Address: [Withheld by requestor]
Address 2: [Withheld by requestor]
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

Greetings!
I've been reading quite a bit on this subject, I'm a perfectionist and have a hard time sending my opinions because I know there is much more to learn.
Our public lands are a valuable resource. They are valuable in their wildness. I am 54, and there is less and less wild land for people to touch, to experience. We as humans need that space. We need open space that can be open, not just bits that are untouchable museum pieces.
There is so much damaged and disturbed land for solar. City roofs, parking lots, tailings piles -- more than enough for the solar plans. As a people we do not need to subsidize more energy corporations, we need to develop tools for people's energy independence, not putting more corporations on the dole.
Please, save our future, save my granddaughters' future, save our heritage, our public lands, minimize solar on the more wild solar lands, let parking lots bid against each other for these projects!

Thank you for your comment

The comment tracking number that has been assigned to your comment is SolarD11784.

Comment Date: April 29, 2011 07:13:14AM
Solar Energy Development PEIS
Comment ID: SolarD11784

First Name: [Withheld by requestor]
Middle Initial:
Last Name: [Withheld by requestor]
Organization: Outdoor Alliance
Address: [Withheld by requestor]
Address 2:
Address 3:
City:
State:
Zip:
Country:
Privacy Preference: Withhold name and address from public record
Attachment: Outdoor Alliance Solar PEIS Comments.pdf

Comment Submitted:

OUTDOOR ALLIANCE

April 29, 2011

Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Re: Bureau of Land Management and Department of Energy's Solar Programmatic Environmental Impact Statement

Dear Solar Energy PEIS Comment Review Staff:

Please accept the Outdoor Alliance's (OA) comments on the Bureau of Land Management (BLM) and the Department of Energy's (DOE) Solar Programmatic Environmental Impact Statement (SPEIS). The Outdoor Alliance supports responsible and sustainable renewable energy development. When pursued thoughtfully, renewable energy projects can coexist with human-powered outdoor recreation. These projects also play a critical role in decreasing the impact of climate change on public lands. We recognize all energy development has ecological and recreational impacts, and we commend your sensitivity to this issue by considering and limiting the impacts to ecosystems, habitat, wildlife and human-powered recreation.

Pursuant to the BLM's new Solar Energy Program and the SPEIS, the OA supports efforts to identify appropriate solar energy development on BLM-administered lands. However, we have specific comments and concerns related to the preferred alternative for your consideration.

Outdoor Alliance

Outdoor Alliance, a coalition of six national, member-based organizations is devoted to conservation and stewardship of our nation's public lands and waters through sustainable human-powered outdoor recreation. Outdoor Alliance includes the Access Fund, American Canoe Association, American Hiking Society, American Whitewater, International Mountain Bicycling Association, and Winter Wildlands Alliance. We represent the interests of the millions of Americans who hike, paddle, climb, mountain bike, ski and snow shoe on our nation's public lands and waters. Collectively, our direct membership is over 100,000, with a network of almost 1,400 clubs covering every state in the country.

Outdoor Alliance has extensive experience working with federal land management agencies and managers across the country concerning recreation and conservation policies. Renewable energy development on public lands is of particular interest, especially on BLM-administered lands where a substantial number of OA members recreate. Recreation opportunities on BLM lands in any of the six southwestern states offer some of the most highly-valued experiences in the country, whether hiking the Old Spanish National Historic Trail, paddling the Rio Chama Wild and Scenic River in New Mexico, climbing at Colorado's Shelf Road or Utah's Indian Creek Canyon, or mountain biking Utah's Hurricane Cliffs. These places, and many others like them are a condition precedent for the $730 billion active outdoor recreation economy and the associated 6.5 million domestic jobs.

OUTDOOR ALLIANCE

BLM's Preferred Alternative: Solar Energy Development Program

Outdoor Alliance appreciates the BLM's efforts to exclude categories of land not suitable for utility-scale solar development, such as the National Landscape Conservation System (NLCS), Areas of Critical Environmental Concern (ACECs), lands with wilderness characteristics, National Recreation Trails, National Historic and Scenic Trails (NHSTs), Wild, Scenic, and Recreational Rivers, and Special Recreation Management Areas (SRMAs), to name a few. Outdoor Alliance has long valued the high-quality recreation opportunities found specifically within these categorical exclusions, which represent some of the best human-powered recreation in the American West.

Outdoor Alliance is, however, concerned about the 0.25 mile corridor from the centerline of an NHST or from the ordinary high water mark on either side of a Wild, Scenic, and Recreational River. Likewise, we recommend buffers be created along the boundaries of all SRMA's. One quarter of a mile is inadequate to address the impacts posed by solar development near these recreation opportunities, and we recommend at least a 0.5 mile buffer to better incorporate, among other impacts, viewsheds and ambient noise associated with solar projects.

We are encouraged to see reliance on existing, new, and upcoming renewal of Land Use Plans in the overall Solar Energy Program integration. We feel that this is crucial for success, and trust that the BLM's Recreation and Visitor Use program services will be fully engaged during this process.

Assessment of Potential Environmental Impacts

Outdoor Alliance has serious and particular concerns regarding the assessment of potential environmental impacts for the Solar Energy Development Program preferred alternative. There is a lack of consideration and detailed analysis required for the specific impacts that could occur related to human-powered outdoor recreation. Considering the social, quality of life and economic dimensions of outdoor recreation, especially in the American West, a more thorough analysis of the direct, indirect, and cumulative impacts on recreation is warranted.

Outdoor Alliance disagrees with the across the board recreation exclusion within lands used for solar energy development, potentially excluding recreation on 22 million acres of BLM land. We do not agree that solar development projects and recreation activities are *per se* mutually exclusive. We do believe there will be examples where the two can co-exist. We therefore suggest greater flexibility in project siting and some accounting for the possibility of continued recreational uses within solar development projects. This is especially true considering the additional acres of recreation impacted related to transmission lines and linear development.

The current SPEIS makes general, broad, permissive, and sweeping statements related to recreation impacts, suggesting they were not fully considered. For example, the SPEIS states "recreational experiences could be adversely impacted in areas proximate to solar energy projects and related transmission", further stating recreation "impacts potentially could be dispersed across the 22 million acres" identified in the preferred alternative (Executive Summary at 16). We suggest more detailed analysis of actual recreation impacts.

OUTDOOR ALLIANCE

As mentioned above, the SPEIS categorically excludes BLM –administered lands not suitable for utility-scale solar development. National Historic and Scenic Trails are one such exclusion; however, the environmental impacts assessment fails to include NHSTs with other categorical development exclusions (Executive Summary at 15). If NHSTs are intended to be included as a categorical exclusion, then they must be included in the list describing all other exclusions throughout the SPEIS. The same argument relates to the visual resources analysis -- NHSTs are excluded from the categorical exclusion list, and must be included (Executive Summary at 23).

Reasonably Foreseeable Solar Energy Development

In light of California's new Renewable Portfolio Standard (RPS) of 33% by 2020, we believe there is time for a revision to California's Reasonably Foreseeable Solar Energy Development (RFSED) analysis. We understand your original models were designed in a manner to account for changes in state RPS', but California's new 33% RPS is a 13% increase over its current RPS, which we believe would significantly alter the estimated number of acres of BLM land that would be developed in California. This is especially important since California's new 33% RPS will take place within the 20-year SPEIS timeframe.

Design Features for Recreation Impacts

Section A.2.2.6 of Appendix A states "[s]olar facilities shall not be placed in areas of unique or important recreation resources." (Appendix A at A-39). We agree and appreciate your sensitivity to special recreation resources; however this statement needs additional clarification to address which "areas of unique or important recreation resources" are meant to be included in this statement. While one could infer this relates to specific categorical exclusions of solar development, it could also apply to other undefined resources. The BLM should define "important recreation resources" and the Outdoor Alliance would be pleased to provide consultation on this definition.

Thank you for your time and consideration of these comments.

Best regards,

Brady Robinson
Executive Director, Access Fund

Wade Blackwood
Executive Director, American Canoe Association

Gregory Miller
President, American Hiking Society

Mark Singleton
Executive Director, American Whitewater

Michael Van Abel
Executive Director,
International Mountain Bicycling Association

Mark Menlove
Executive Director, Winter Wildlands Alliance

ACCESS FUND · ACA American Canoe Association · American Hiking Society · AMERICAN WHITEWATER · IMBA International Mountain Bicycling Association · WINTER WILDLANDS ALLIANCE

Thank you for your comment, Sallie MCGUIRE.

The comment tracking number that has been assigned to your comment is SolarD11785.

Comment Date: April 29, 2011 11:54:02AM
Solar Energy Development PEIS
Comment ID: SolarD11785

First Name: Sallie
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Last Name: MCGUIRE
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Attachment: Solar_PEIS_ReviewForm Jan 2011.doc

Comment Submitted:

Standard Review Form for
Draft Solar Energy Development PEIS (Issued December 2010)

Reviewer's Name: __Sallie McGuire_____ **Reviewer's Organization**: USACE, Regulatory, SPL

Reviewer's email address: _Sallie.mcguire@usace.army.mil_ **Reviewer's Telephone numbers**: _(602) 230-6950

Primary Disciplinary Area (e.g., ecology, land use planning, regulatory oversight): _Regulatory/waters of the U.S._____

Section(s) or Chapter(s) Reviewed: ____Chapter 5_____

EIS Section	Page/Line	Comment/Suggested Revision	Action *(for use by ANL)*
5.2.1	**5-4/12-13**	**Address conversions from aquatic to terrestrial habitats as impact**	
5.2.1	**5-4/20**	**Should also address truncation of wildlife habitat connectivity**	
5.9.3.1	**5-47/12-24**	**Concern for developers only applying hydrology as a single parameter when considering waters if the U.S.**	
Sidebar: "Protecting Desert Streams in a Desert Landscape"	**5-42**	The most relevant part of the CWA for protecting intermittent and ephemeral streams is Section 404, which requires a permit with the U.S. Army Corps of Engineers (USACE) before any dredged or fill materials are placed into [delete quotations] "jurisdictional waters" [delete rest of sentence]for the purpose of minimizing any adverse impacts.	
"	"	Delete sentence: "The difficulty in applying the permitting process of Section 404 is in the determination of what constitutes jurisdictional waters"	
"	"	Recent U.S. Supreme Court decisions (Rapanos v. United States and Carabell v. United States) have [DELETE complicated]complicated [REPLACE with "changed"] the process of identifying jurisdictional waters with respect to intermittent and ephemeral streams by requiring them to have a "significant nexus" to the more traditionally defined navigable waters (see EPA and USACE [2007] for further details regarding this distinction) in order to fall under jurisdiction of Section 404 of the CWA	

To add addition boxes, press tab.

Thank you for your comment, Helen O'Shea.

The comment tracking number that has been assigned to your comment is SolarD11786.

Comment Date: April 29, 2011 17:21:45PM
Solar Energy Development PEIS
Comment ID: SolarD11786

First Name: Helen
Middle Initial: C
Last Name: O'Shea
Organization: Natural Resources Defense Council
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Address 2: 20th Floor
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City: San Francisco
State: CA
Zip: 94104
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Solar DPEIS Comments California Final (NRDC and Partners 4_29_11).pdf

Comment Submitted:

Attached please find the comments of the Natural Resources Defense Council and partners on the California section of the Solar PEIS.

April 29, 2011

Delivered via electronic submission to the BLM Solar PEIS website (http://solareis.anl.gov) and U.S. mail.

Linda Resseguie, BLM Solar PEIS Project Lead
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue - EVS/240
Argonne, IL 60439

Re: Comments on Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear Ms. Resseguie:

Please accept and fully consider these comments on the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (DPEIS) on behalf of the Audubon Society, California Native Plant Society, California Wilderness Coalition, Californians for Western Wilderness, Defenders of Wildlife, the National Parks Conservation Association, the Natural Resources Defense Council, Point Reyes Bird Observatory Conservation Science, Sierra Club, The Wilderness Society, and The Wildlands Conservancy. We appreciate the opportunity to comment.

I. Introduction

Clearly, our nation‘s growing addiction to fossil fuels, coupled with the unprecedented threats brought about by global warming, imperil the integrity of our wildlands and wildlife as never before. To sustain our wildlands, our wildlife and our human communities, the undersigned believe the nation must transition away from fossil fuels as quickly as possible. To do this, we must eliminate energy waste, moderate demand through energy efficiency, conservation, and demand-side management practices, and rapidly develop and deploy clean, renewable energy technologies, including at the utility-scale. Renewable energy development is not appropriate everywhere on the public lands, however, and thorough review under the National Environmental Policy Act is an essential part of determining which of the many proposed utility-scale projects should be permitted to go forward.

We strongly believe that long-term, the environmentally responsible success of the Bureau of Land Management‘s (BLM) solar energy program depends on developing policy and guidelines that guide projects to the most appropriate locations, thus limiting environmental impacts and

reducing obstacles to construction of the most appropriate projects. The Draft Solar Programmatic Environmental Impact Statement (DRAFT PEIS) offers just such an opportunity, and we look forward to working with the BLM to ensure that: 1) appropriate Solar Energy Zones (SEZ) are identified and designated; 2) solar projects are guided to those zones; 3) a process is developed for identifying and designating new zones as appropriate; and 4) additional policy needed to support an environmentally responsible solar energy development program on our public lands is developed.

These comments are focused on the elements of the PEIS that address California in particular.

II. Purpose and Need

There is a considerable amount of solar energy project planning and development underway in California. As of February 2011, there were at least 33,382 MW of solar energy generation facilities planned, proposed and or permitted in California. Below is a summary of these facilities by land ownership and location.

Projects on federal (public and military bases) Statewide	20,540 MW
Projects on private land Statewide	12,842 MW
Total Statewide	33,382 MW
<u>Within the California Desert Conservation Area (CDCA)</u>	
The summary of solar projects is as follows:	
Projects on federal (public and military bases)	20,100 MW
Projects on private land	4,252 MW

We call attention to the fact there are a large number of solar projects planned, proposed or permitted on public land in the CDCA. Of the 20,100 MW of projects on federal land, 19,100 MW are on public lands.

The purpose and need for the proposed action and alternatives should address the need for renewable energy development in California and specifically in the CDCA. This issue needs to be fully considered with regard to 1) Energy needs and grid integration issues, including but not limited to energy storage and transmission capacity in California, 2) Relationship to the Energy Policy Act of 2005, 3) Secretarial Order for development of 10,000 MW of renewable energy from public lands, and 4) BLM‘s legal, regulatory and policy responsibilities for management of Public Lands within the CDCA.

The DRAFT PEIS has failed to provide an adequate foundation to support its assumption that 75% of solar development will occur on BLM lands. We recommend the Bureau re-assess its assumptions for California at a minimum, taking into consideration several factors, including but not limited to:

- The significant amount of solar electric generation proposed on marginal and abandoned agricultural land: Given the acres of low habitat value, low resource mechanically disturbed (agricultural) land that appears to be available for solar development in the Central

Valley, it seems unreasonable to assume that more solar energy would be developed on BLM land than on private land. This is especially the case given the high priority California has placed on renewable energy development throughout the state, not just on BLM-administered land.

- The potential for additional disturbed and agricultural land conversion in areas with insolation levels between 5.0 and 6.5 kilowatt-hours per square meter per day. (Note: public lands under consideration for solar energy development were limited to those with at least 6.5 kilowatt-hours per square meter per day, which is considered an ~~"i~~deal" rating.)

- It is also important to note that all of the BLM-approved solar projects on BLM-administered land are currently the subject of federal court litigation. Many smaller projects proposed on private land that is less environmentally sensitive have been undergoing environmental review with Negative Declarations or Mitigated Negative Declarations allowing for a faster development schedule. Moreover, the BLM in California reports that it is seeing few new ROW applications and that, more often than not, the new applications that it has received are applications for gen-ties crossing public lands, rather than for solar power plants.
- It is similarly important to take into consideration the pace and volume of distributed generation in California as this will impact the need for utility scale projects over time. We expect that small-to-midscale and rooftop solar will increase rapidly over the next decade in California; there is strong support from the current Governor and legislature for improved pricing mechanisms and other policy shifts to support this growth.

Given the reduced environmental effects of solar projects on previously disturbed agricultural and other private lands as compared to undisturbed pristine desert, it is not only likely that less than 75% of the solar development in California will be on BLM-administered lands, it is even possible that solar development on private land in the state could overtake that of BLM-administered lands over the next couple of years.

In conclusion, the very aggressive forecast for solar development on public lands in California as demonstrated through the RFD Scenario clearly supports a comprehensive zone-based approach rather than the preferred alternative.

III. Alternatives

A. The BLM should select as its preferred alternative a modified Solar Energy Zones (SEZ) Alternative

The SEZ Alternative would designate 24 Solar Energy Zones (SEZ) across the six states included in the DRAFT PEIS. The SEZs are areas that have been identified by BLM according to criteria which place a priority on excellent solar resources, flat land and proximity to existing roads and electrical transmission lines, and limited conflicts with important wildlife habitat, wildlands, recreation areas and other resources and values. The SEZ Alternative would require that solar projects be built in these low-conflict areas. By focusing on the places with the best chances for

successful projects, the Solar Energy Zones Alternative will lead to solar development that is faster, cheaper and better for the environment, consumers and project developers.

With appropriate modifications, a modified SEZ Alternative offers the best way to develop a successful and environmentally responsible solar program for our public lands. One important modification regards the removal of problematic SEZs and the refinement of others. Not all of the currently identified SEZs are appropriate for development, and it is important that the BLM continue to refine the SEZ selection through the PEIS process – the comments included in section V are intended to help the BLM refine the SEZs and identify and complete additional analysis that will facilitate efficient and environmentally responsible permitting of projects once the PEIS is finalized. By focusing on the places with the best chances for successful projects, a modified Solar Energy Zones Alternative will lead to solar development that is faster, cheaper and better for the environment, consumers and project developers.

Beyond the benefits of focusing on the places with the best chances for successful solar development, it is important to note that the modified SEZ Alternative is an excellent starting point for the BLM's solar program. The SEZs currently under consideration in the DRAFT PEIS include more than three times as much land as the BLM forecasts will be developed during the 20 year life of the PEIS. Though the acreage of the SEZs may change through refinements in the PEIS process, the modified SEZ Alternative offers plenty of flexibility to build a foundation for solar development on public lands. Another important modification to the SEZ alternative is the creation of a robust and efficient process to designate new SEZs in the future. With our recommendation that the BLM create a process for designating new SEZs going forward, the BLM can easily use this starting point to build a roadmap to our clean energy future.

Analysis and adoption of this hybrid alternative in the final PEIS will allow the BLM to fulfill its obligations with regard to the statutory standards established in the Federal Land Policy and Management Act for the CDCA as well as the policies contained in the CDCA Plan while achieving federal and state renewable energy goals. More specifically, analysis of this option would provide greater protection to the public lands and resources in the CDCA while its adoption will not only protect those lands and resources but also avoid their unnecessary and undue degradation as required by FLPMA.

B. **The BLM should not adopt the Solar Development Program (SDP) alternative**

While a modified SEZ Alternative offers great promise for building a successful, environmentally responsible solar program, the SDP Alternative risks facing the same problems which have plagued the BLM's oil and gas program – projects spread scattershot across the West, damage to wildlife and wildlands, and costly conflicts, delays and litigation. We are extremely concerned that the BLM has chosen the SDP Alternative as its Preferred Alternative, and we urge the BLM to select a comprehensive zone-based approach instead.

The SDP Alternative would jeopardize both our clean energy future and our western wildlands. The BLM should not carry forward a plan that opens approximately 22 million acres to development – this is over 100 times more land than what the agency's own analysis says is really needed, and includes many places that should be protected for wildlife habitat and clean

air and water. Section III includes details on some of the places that would be particularly inappropriate and problematic and yet would be open for solar development under the SDP Alternative.

This outdated approach could impede the BLM's solar program just as it begins to take off. Opening such huge and potentially inappropriate areas for development without meaningful incentives to locate projects in zones undermines the effort to carefully choose low conflict/high resource SEZs, and will ultimately inhibit the development of the fledgling solar energy industry, causing major setbacks to our desperately needed transition to a clean energy economy.

For these reasons, the BLM should choose a comprehensive zone-based approach as the Preferred Alternative in the final PEIS. By focusing on areas where projects have the greatest chance for success, rather than wasting time and resources "fixing" bad proposals, the BLM can ensure that good projects move forward and our most sensitive wildlands and wildlife habitat are protected.

C. As part of the modified SEZ alternative, the BLM should develop a process for identifying and designating new SEZs, as appropriate

As noted above, the SEZs as currently drawn include more than twice as much land as the BLM forecasts will be developed during the 20 year life of the PEIS, and even with expected refinements, will provide an excellent foundation on which to build the BLM's solar program.

We believe that there are also other lands outside of the current SEZs that may be appropriate for SEZ designation and subsequent project development. To ensure that the BLM's solar program continues to grow in an environmentally responsible way, the agency should create a process for designating new SEZs as appropriate in the future. This process must be designed to accommodate the ongoing state/federal processes currently underway to identify development areas in California (e.g., DRECP and scoping already in progress on the West Chocolate Mountains renewable energy zone[1]). By creating a process that prioritizes SEZ designation on lands with suitable solar resources, close to existing roads and transmission lines, and few conflicts with natural and cultural resources, the BLM can carry its guided development model forward as the solar program continues to grow.

Development of a robust and efficient process to designate new SEZs will provide the benefits of continuing to identify and prioritize appropriate areas for development while avoiding the problems and controversy of the SDP Alternative.

In the process of identifying and designating new zones in the CDCA, the BLM should prioritize the following categories of lands for consideration as new zones:

[1] *Proposed West Chocolate Mountains Renewable Energy Evaluation Area.* In a February 10, 2010 Notice of Intent (NOI) in the *Federal Register*, the BLM El Centro Field Office announced its intent to prepare an EIS to consider an amendment to the CDCA Plan to identify whether 21,300 acres (86.2 km2) of BLM-administered lands within the West Chocolate Mountains area should be made available for geothermal, solar, or wind energy development. The Evaluation Area lies about 25 mi (40 km) north of the proposed Imperial East SEZ in Riverside County, east of Niland and northeast of El Centro, California.

- Lands that have been mechanically disturbed, i.e., locations that are degraded and disturbed by mechanical disturbance:
    - Lands that have been "type-converted" from native vegetation through plowing, bulldozing or other mechanical impact often in support of agriculture or other land cover change activities (mining, clearance for development, heavy off-road vehicle use).[2]
- Public lands of comparatively low resource value located adjacent to degraded and impacted private lands on the fringes of the California Desert Conservation Area:[3]
    - Allow for the expansion of renewable energy development onto private lands.
    - Private lands development offers tax benefits to local government.
- Brownfields and contaminated or previously-contaminated sites:
    - Revitalize idle or underutilized industrialized sites.
    - Existing transmission capacity and infrastructure are typically in place.
- Locations adjacent to urbanized areas:[4]
    - Provide jobs for local residents often in underserved communities;
    - Minimize growth-inducing impacts;
    - Provide homes and services for the workforce that will be required at new energy facilities; and
    - Minimize workforce commute and associated greenhouse gas emissions.
- Locations that minimize the need to build new roads.
- Locations that could be served by existing substations.
- Areas proximate to sources of municipal wastewater for use in cleaning.
- Locations proximate to load centers.
- Locations adjacent to federally designated corridors with existing major transmission lines.[5]

In addition, the BLM should also utilize screens as "ifters" to identify appropriate areas, including the following criteria:

- Zones comprised of Lands classified for Intensive Use, Unclassified lands, and lands classified for disposal.
- Exclusion of lands falling within California Essential Habitat Connectivity Areas (Spencer et. al 2010[6]).
- Exclusion of lands falling within BLM-designated ACECs, Critical Habitats, Unusual Plant Assemblages and Wildlife Habitat Management Areas.
- The potential for distributed generation to provide a cost effective and expeditious alternative to remotely located, transmission-dependent solar farms.

[2] Some of these lands may be currently abandoned from those prior activities, allowing some natural vegetation to be sparsely re-established. However, because the desert is slow to heal, these lands do not support the high level of ecological functioning that undisturbed natural lands do.

[3] Based on currently available data.

[4] Urbanized areas include desert communities that welcome local industrial development but do not include communities that are dependent on tourism for their economic survival.

[5] The term "federally designated corridors" does not include contingent corridors.

[6] Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt,M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

Additionally, in designating new zones, the BLM should fully explore opportunities for ―conjunctive use," i.e., for joint utilization of private and adjacent federal lands.

IV. Overarching issues that should be addressed for solar development in California

A. Impacts to water resources

The California desert is an arid environment and many of the basins that contain excellent solar resources are not adjudicated and are already in overdraft. Given the importance of water for proper ecosystem function, it is critical that the BLM ensures that solar development does not allow unacceptable impacts to both the quantity and quality of water resources and the ecosystems, habitat and species that depend on them.

Quantity

The California Energy Commission's policy regarding water use for solar thermal technologies states that the Commission ―will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be ―environmentally undesirable' or ―economically unsound'."[7] There has been acceptance of this policy in California among the solar industry,[8] where alternatives considered to date have included use of brackish water as well as dry-cooling.[9]

In some basins with little or no available water, only dry cooled or non-cooled technologies are currently feasible and water restrictions in the California desert are likely to become more stringent. However, cooling technologies may improve, and there may be opportunities to use some water for wet/hybrid/dry cooled projects if municipal wastewater can be utilized.

The BLM should explicitly adopt water use policies in California that are consistent with the CEC policy but are stronger in their evaluation of alternative water supply sources in that they would prioritize *environmental* rather than economic impacts in their analysis of feasibility.

Quality

In the CDCA, the BLM policy for management of surface and groundwater according to Multiple Use Class is as follows:

- Limited Use Class: Areas designated in this class will be managed to provide for the **protection and enhancement of surface and groundwater resources**, except for instances of short-term degradation caused by water development

[7] California Energy Commission, Preliminary Staff Assessment, Beacon Solar Energy Project, Application For Certification (08-AFC-2), Kern County (Posted April 1, 2009) (hereinafter ―Beacon Staff Draft"), p. 4.9-5.

[8] See, e.g., RETI Phase 1B Report, p. 3-3, describing agreement of all RETI stakeholders, including solar generators, to the assumption, for RETI purposes, that dry-cooling would be used except when reclaimed water from communities of a certain size is available.

[9] In the case of the Beacon project, CEC analysis revealed that dry-cooling could ―reduce … consumption of potable water by up to 97 percent." Beacon Staff Draft, p. 1-6. In addition, the analysis revealed that not only were both of these options economically feasible, but also that dry cooling might ―actually result in lower project operating costs." Id., p. 4.9-48.

projects. Best management practices, developed by the Bureau during the planning process outlined in the Clean Water Act Section 208, and subsequently, will be used to avoid degradation and to and comply with Executive Order 12088. (CDCA Plan, Table 1, Multiple Use Class Guidelines) (Emphasis added)

- Moderate and Intensive Use Classes: Areas designated in this class will be managed to **minimize degradation of water resources**. Best management practices, developed by the Bureau during the process outlined in the Clean Water Act, Section 208, and subsequently, will be used to keep impacts on water quality minimal and to comply with Executive Order 12088. (CDCA Plan, Table 1, Multiple Use Class Guidelines) (Emphasis added)

The BLM must adopt water use policies in the final PEIS that are consistent with the specific management policies for water resources in the CDCA and that are consistent and supportive of CEC water use policies.

B. Protection of Habitat Connectivity Areas

Landscape-level linkages provide connectivity between species populations, wildlife movement corridors, ecological process corridors (e.g., sand movement corridors), and climate change adaptation corridors. They also provide connections between protected ecological reserves such as National Park units and Wilderness Areas. Special consideration must be given to desert national parks in terms of their value as large, protected landscapes and opportunities that still exist to connect them to other protected lands. Designation of solar zones should not preclude such opportunities.

The long-term viability of existing populations within such reserves may be dependent upon habitat, populations or processes that extend outside of their boundaries. While it is possible to describe current wildlife movement corridors, the problem of forecasting the future locations of such corridors is confounded by the lack of certainty inherent in global climate change. Hence the need to maintain broad, landscape-level connections. To maintain ecological functions and natural history values inherent in parks, wilderness and other biological reserves, trans-boundary ecological processes must be identified and protected. Specific and cumulative impacts that may threaten vital corridors and trans-boundary processes should be avoided.

The Desert Renewable Energy Conservation Plan (DRECP) will also be looking at the issue of habitat connectivity and reserve design while the Solar PEIS is being finalized, however the DRECP will not be completed until after the ROD is issued for the PEIS. In order to not preclude optimum conservation opportunities in the DRECP including protection of key habitat connectivity areas, the BLM should adopt a no-regrets plan of avoiding known key habitats in the CDCA pending completion of the DRECP. In order to support our recommendation regarding this, we have attached the Independent Science Advisors Report from the DRECP as **Appendix A.**

We recommend that the BLM:

1) Exclude –California Essential Habitat Connectivity Areas" (Spencer et. al 2010[10]) in the CDCA from lands available to solar development

Additional connectivity areas being identified by the US Fish and Wildlife Service and California Department of Fish and Game, particularly for recovery of the desert tortoise, should also be excluded from development. BLM should incorporate this new information from the Fish and Wildlife Service into the final PEIS by identifying exclusion areas within the SEZs as appropriate.

2) Improve analysis of impacts and proposed mitigation to landscape-scale habitats that link large blocks of intact habitat that support and sustain Special Status Species.

For public lands affected in California, we recommend that the following sources of information on habitat connectivity be used to develop a more accurate, complete and refined impact assessment, which should help guide the development of more focused and effective mitigation measures, such as impact avoidance.

http://www.scwildlands.org/projects/caltrans.aspx

http://www.scwildlands.org/projects/desert.aspx

http://www.scwildlands.org/projects/jtree.aspx

http://www.scwildlands.org/reports/CEHC_Plan_MASTER_030210_3.pdf

http://www.scwildlands.org/reports/SCML_SanBernardino_Granite.pdf

http://www.scwildlands.org/reports/Missing_Linkages.pdf

http://www.dfg.ca.gov/habcon/connectivity/

All habitat connectivity corridors identified in the above sources and BLM's own management plans must be avoided for development of solar projects and associated infrastructure until the DRECP is finalized at which point a fuller picture of the importance of these areas will be available.

C. Sand Transport Areas

An element of habitat connectivity unique to the desert is sand transport corridors and the sand dune ecosystems that rely on them. Sand dunes provide habitat for a suite of rare species that are evolutionarily adapted to exploiting the constantly shifting sands, including fringed-toed lizards and endemic insects and plants. Dunes in the deserts typically form as a result of eolian (wind-blown) processes, where sand particles are moved with the prevailing winds. These eolian

[10] Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt,M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

processes form sand transport corridors. Blockage of even a portion of the sand transport corridors will impact the "downstream" dunes systems upon which rare species rely and may eventually eliminate them.

To date, three solar projects and at least one substation project have had to significantly reconfigure their footprints or relocate to try to avoid these important sand transport corridors and minimize the impacts to this rare habitat type. The DRAFT PEIS currently fails to acknowledge this unique process and rare habitat.

The final PEIS should, to the extent possible, identify sand transport corridors (both the source areas and "sink" areas) within the CDCA. Muhs et al. (2003) document some of the sand transport corridors that actively move substrates across the landscape in the western deserts. Additional delineation of the sand transport corridor is specifically available for the proposed Riverside East CREZ, which has a large sand transport corridor running through it (ESA/PSW 2011). Models have also been developed to identify conservation areas that are essential to maintain sand transport corridors (Barrows 1996).

The final PEIS, Record of Decision and the new solar program should exclude sand transport areas from consideration for solar development. These exclusion areas should be specifically called out in the geographic description of the California SEZs.

D. **Management of the California Desert Conservation Area (CDCA)**

As part of FLPMA, Congress designated 25 million acres of southern California as the California Desert Conservation Area ("CDCA"). 43 U.S.C. § 1781(c). Congress declared in FLPMA that the CDCA is a rich and unique environment teeming with "historical, scenic, archaeological, environmental, biological, cultural, scientific, educational, recreational, and economic resources." 43 U.S.C. § 1781(a)(2). Congress found that this desert and its resources are "extremely fragile, easily scarred, and slowly healed." *Id.* For the CDCA and other public lands, Congress mandated that the BLM "shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands." 43 U.S.C § 1732(b).

Section 601(b) of FLPMA established the management standards for the CDCA: "*It is the purpose of this section to provide for the immediate and future protection and administration of the public lands in the California desert within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality."*

The CDCA Plan includes a management framework and plan for specific wildlife species of concern and their habitats, which is designed to stabilize and enhance these resources through implementation of various conservation actions, including impact avoidance and minimization requirements associated with multiple uses of the public lands.

The PEIS should address the management standards for the CDCA as the framework within which to analyze the effects of the proposed action and each of the alternatives. Given the statutory uniqueness of the CDCA, it is especially critical that the PEIS address the effects of the proposed action and alternatives on the management standards established in FLPMA. We

recommend that particular attention be given to the "future protection" and "maintenance of environmental quality" standards. We strongly recommend that the current condition and trend of public lands and their biological resources in the CDCA be included in the analysis, and that it include a robust cumulative impact analysis.

To the maximum extent possible the PEIS must contain an analysis of the effects of each alternative on the CDCA Plan policies for management of biological resources, including whether or not the effects of the alternatives would preclude BLM from fulfilling its management obligations for biological resources.

The CDCA Plan, as amended, includes various requirements for long-term management of wide-ranging species, including but not limited to the Desert Tortoise, Mojave Fringe-toed Lizard and Desert Bighorn Sheep. (CDCA Plan, page 31). The PEIS must include an analysis of the effects of the alternatives on BLM's commitment to stabilize protect wide-ranging species in the CDCA. This is especially important considering that BLM has not prepared range-wide plans for the Mojave Fringe-toed Lizard and Desert Bighorn Sheep, or for other wide-ranging species such as the Golden Eagle, Prairie Falcon, Burrowing Owl, LeConte's Thrasher, American Badger and Desert Kit Fox. This analysis must also address the cumulative effects of multiple land uses on BLM's responsibility to conserve these wide-ranging species.

The DRAFT PEIS fails to recognize and analyze the effect of the proposed action and alternatives on certain resource management plan designations in the CDCA, including 1) Limited Multiple Use Classes, 2) Moderate Multiple Use Classes, 3) designated Wildlife Habitat Management Plan areas, and 4) designated Special Areas. These designations in the CDCA Plan, as amended, form part of the overall wildlife conservation framework for public lands, which are described as follows:

- **Limited Multiple Use Class** areas are intended to protect "…sensitive, natural, scenic, ecological, and cultural resource values. Public lands designated as Class L are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished." (CDCA Plan, page 13) Furthermore, the CDCA Plan requires that BLM exercise judgment in allowing consumptive uses only up to the point that sensitive natural and cultural values might be degraded. (CDCA Plan, page 21)

- **Moderate Multiple Use Class** areas are intended to provide "…controlled balance between higher intensity use and protection of public lands. This class provides for a wide variety or present and future uses such as mining, livestock grazing, recreation, energy, and utility development. Class M management is also designed to conserve desert resources and to mitigate damage to those resources which permitted uses may cause." (CDCA Plan, page 13)

- **Wildlife Habitat Management Plan** areas are those public lands where detailed Habitat Management Plans (HMPs) are "…developed specifically for wildlife habitats or species which require intensive, active management programs. In the Desert Plan, HMPs can be placed in any multiple-use class. Multiple-use class guidelines set the limits for the

recommendations that can be included in an HMP, Habitat Management Plans would be of lower priority than ACECs and would compete with other activity and use plans for preparation and implementation." (CDCA Plan, page 29)

- **Designated Special Areas** are those public lands in the CDCA highlighting ―…habitats and species known to be important for special consideration in the environmental assessment process for any kind of project." (CDCA Plan, page 29)

The affected environment and environmental impacts sections of the DRAFT PEIS for public lands in the CDCA that would be affected by the proposed action and alternatives need to be revised to include designated areas in the CDCA described in items 1 through 4, above. In addition, the BLM must include in the FINAL PEIS a no-regrets plan of avoidance of known key habitats in the CDCA pending completion of the Desert Renewable Energy Conservation Plan.

E. **Fencing**

In the state-specific volumes of the DRAFT PEIS that address management directives specific to the proposed Solar Energy Zones, it is repeatedly stated that the fencing around solar energy developments should not block the free movement of mammals, particularly big game species. In the section that discusses guidelines for development for areas outside SEZs that are included in the BLM preferred alternative, however a different standard for fencing is set forth. Specifically, on line 36, page 128 of Volume 2 it states that ―Fences should be built (as practicable) to exclude livestock and wildlife from all project facilities, including all water sites."

Further discussions with BLM staff have made it clear that the requirement to avoid blocking mammal movement was intended to apply to migration corridors and population-level effects on species, not to movements of individual mammals, similar to the categorical exclusions for renewable energy fencing recently proposed by DOE. For example, if a project within a SEZ spanned an important wildlife movement corridor, BLM would recommend it be built in two separate sections or phases, and that those individual facilities would have exclusion fencing around them but movement would be allowed between them. We are relieved to get this clarification, and the BLM should make this clear in the Final PEIS. This clarification negates most of the concerns that we have regarding non-exclusion fencing within projects which include:

- Animals enter the project area and are injured or killed by equipment
- Small mammals overpopulate disturbed ground in project footprints, causing raptors and other predators to be drawn to projects
- Listed species enter projects and are killed, resulting in take
- Large mammals start grazing on cleared land within projects, spreading invasive weeds through increased disturbance and seed transport into the project
- Animals damage equipment, projects have difficulty obtaining funding or insurance due to increased risks associated with fencing that allows animals to enter project areas

Beyond clarifying this question, we urge that fencing recommendations be kept consistent

regarding animal movement for all solar projects on BLM lands. Prescriptions that intend to avoid impacts to migration corridors should apply to projects both inside and outside of SEZs. In addition, it's important to emphasize that issues around wildlife movement and habitat corridors are landscape-scale issues; they do not receive adequate consideration when approached at the scale of project-level permitting, and should instead be addressed at the scale of individual SEZ regions and beyond. Project-level efforts should then be tailored to be compatible with these landscape-scale migration corridor analyses.

F. **Cultural Resources**

These comments on the proposed SEZs in California offer limited commentary on cultural resources. They do not address these issues in depth because we lack the necessary expertise to do so. With that said, we strongly believe the BLM must do a better job going forward of considering these resources, consulting with tribes, and complying with the applicable laws regarding cultural resources. Not only are these resources extraordinarily important but the litigation filed last year proves the need for the Bureau to conduct more robust analysis than was completed during the first round of "fast track" projects.

The DRAFT PEIS should clearly state that a Record of Decision on the final PEIS does not preclude or substitute for the continuing process of consultation with parties in order to comply with Section 106 of the National Historic Preservation Act during subsequent project specific EIS determinations, and that requirements to meet applicable part of Section 106 have not yet been made.

In order to comply with both the requirements and intent of the NHPA and other obligations for consultation, the Solar PEIS must set out more specific requirements and commitments for inventory and consultation, as described in the programmatic comments on the PEIS submitted by The Wilderness Society et al.

G. **Golden Eagle**

The DRAFT PEIS correctly predicts the presence of Golden eagle in all of the proposed SEZs in California. Golden eagle (*Aquila chrysaetos*) is a fully protected species under The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). "Take" of Golden eagle means "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb." "Disturb" means "to agitate or bother a Bald Eagle or a Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." Loss of foraging habitat that results in a decrease in productivity or nest abandonment is considered "take". Golden eagle and Golden eagle habitat may be found in grasslands, shrublands, pinyon-juniper woodlands, and ponderosa pine forests, and occasionally in most other habitats, especially during migration and winter. Golden eagles nest on cliffs and sometimes trees in rugged areas, with breeding birds ranging widely over surrounding areas.

BLM should require solar developers to follow USFW Interim Golden Eagle Technical Guidance Protocols of March 25, 2010 in determining the presence of Golden Eagle on a project site and within a 10 miles radius outside of a project site in consultation with USFW Service and CDFG. Take of Golden eagles and other raptors protected by the Migratory Bird Treaty Act should be avoided. The PEIS is lacking in its assessment of this species.

H. Native Plants

The California desert supports a wide variety of plants that have uniquely adapted to the desert ecosystem and must be considered in the PEIS. The California Native Plant Society has provided draft lists of vegetation types known or likely to occur in the four proposed SEZs. These vegetation types include many plant species that are rare, sensitive or species of concern. The list is provided as **Appendix E.**

I. Desert tortoise translocation/relocation

The latest USFWS guidance should be followed for translocation of desert tortoises for any solar projects. The most current guidance is found in the document –TRANSLOCATION OF DESERT TORTOISES (MOJAVE POPULATION) FROM PROJECT SITES: PLAN DEVELOPMENT GUIDANCE" (U.S. Fish and Wildlife Service, August 2010).[11]

In addition to following this guidance, the following guidelines should be followed:

- The USFWS recognizes that translocation of tortoises is still experimental, and study designs of translocations should be set up to test for success in a scientifically rigorous manner.[12]
- Tortoises should only be translocated into the same genetic unit and Recovery Unit.
- Thorough surveys of habitat characteristics of recipient and control sites should be undertaken before project approval, including vegetation cover and composition, surficial geology and substrate suitability for burrows, forage plant quality, and nearness to roads, disturbance, and urbanization.[13]
- Translocation plans should be finalized before project approvals, and made public for review.

J. Soil erosion and associated vegetation impacts

We question the assumption that there should be full removal of existing vegetation in areas to be developed. Proposing development in this manner assumes use of a limited number of technologies with no changes in technology and does not acknowledge that projects can be done in sections and that some accommodation of the natural landscape must be considered.

Impacts to soil resources are some of the most challenging issues for solar projects proposed in the desert. Development of adequate drainage, erosion, and sediment control plans is a

[11] http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/dt/USFWS%20DT%20Transocation%20Guidance.docx
[12] http://www.deserttortoise.org/abstract/2011DTCSymposiumAbstracts.pdf
[13] Dr. Kristin Berry, California Energy Commission hearing for Calico Solar Project, 2010.

complicated, time consuming, and challenging task. Desert soils are particularly fragile, and development can have significant impact on soil crusts. Soil crusts and vegetation play a vital role in retaining desert topsoil; when areas are bladed, a complex of interrelated negative impacts occurs. Biological soil crusts, composed of a community of mosses, lichens, algae, fungi, and bacteria, form a textured, porous layer a few centimeters thick above the ground surface and a fibrous mat that extends below ground, holding topsoil in place, inhibiting the spread of invasive weeds, and facilitating nitrogen fixation and carbon cycling to enhance soil fertility. When these soils are disturbed, the desert land generates more dust and the area is more susceptible to invasive plant species. Native plant communities as well as soil crusts could take many years to re-establish after disturbance in the arid, low productivity environment of the desert.

Volume 1 Chapter 5 (potential mitigation measures for all SEZs) makes the vague recommendation that disturbance to soil crusts should be avoided to the extent possible, but it doesn‘t define the density of soil crusts that would be sufficient to put an area off limits. Many areas where soil crusts are sparsely scattered throughout the landscape due to years of disturbance by vehicles and cattle, and it‘s not clear in this context if destruction of the remaining soil crusts by development would be acceptable because they already have reached such a low density, or if they should be preserved to re-colonize these areas. Chapter 5 contains a short discussion of fugitive dust which states —…exposed soil would provide a continual source of fugitive dust throughout the life of the facility, resulting in the long-term deposition of particulates onto plants in the vicinity. Such deposition could lead to long-term changes in plant community composition and productivity in the vicinity of a solar energy facility.”

The DRAFT PEIS also states that —In areas with highly erodible soils…wind erosion of disturbed soils could affect particulate air quality…based on the large area that could be disturbed and that the fact that stabilization is never fully effective, wind erosion during operation needs to be addressed in site-specific assessments during the ROW application process to assess the severity of these impacts.” Chapter 5 mentions that water is not a viable dust control agent in arid areas with water scarcity, that pavement cannot be installed everywhere, that dust suppressants cannot be sprayed everywhere, and that native vegetation should be replanted in temporarily disturbed areas (but not within the facility footprints). Roads and other high use areas as well as temporarily disturbed areas are addressed, but how dust management will be implemented across the large expanses of cleared areas with low traffic is not.

Soil disturbance should be minimized, and any reseeding should be done with native endemic species. Every effort to minimize introduction and spread of non-native species should be employed, including ensuring that reseeding mixtures are not polluted with non-native seed. Impacts of loss of native vegetation should be evaluated.

The Final PEIS should include a thorough analysis of the impacts on the soils, including any biological soil crusts, as well as the potential for introducing non-native invasive plant species. We ask that BLM encourage solar developers to limit the impacts to soils and vegetation, minimizing and mitigating where impacts are unavoidable. To ensure robust environmental protections and timely completion of permitting documents and steps, it is critical that the BLM dedicate adequate time and resources early in the process to addressing these issues thoroughly.

Assessment of the existing plant community is essential; surveys of the sites should be done early and at several different times during the year, particularly for any sensitive species. Unfortunately, in a dry ecosystem some species are only present or active for a few weeks each year. In dry years, some plant species will not appear at all, although viable root systems are present underground. Therefore, any historical vegetation or wildlife surveys in these areas should inform the Final PEIS.

Destruction of surface hydrologic function is another important impact that should be addressed in the FINAL PEIS. Many potential development areas are located on extensive alluvial fans, containing many ephemeral drainages and incised washes in some cases.

Levick et al (2008) in a recently released research report on desert ephemeral and intermittent streams offered the following:

> "Ephemeral and intermittent streams provide the same ecological and hydrological functions as perennial streams by moving water, nutrients, and sediment throughout the watershed. When functioning properly, these streams provide landscape hydrologic connections; stream energy dissipation during high-water flows to reduce erosion and improve water quality; surface and subsurface water storage and exchange; ground-water recharge and discharge; sediment transport, storage, and deposition to aid in floodplain maintenance and development; nutrient storage and cycling; wildlife habitat and migration corridors; support for vegetation communities to help stabilize stream banks and provide wildlife services; and water supply and water-quality filtering. They provide a wide array of ecological functions including forage, cover, nesting, and movement corridors for wildlife. Because of the relatively higher moisture content in arid and semi-arid region streams, vegetation and wildlife abundance and diversity in and near them is proportionally higher than in the surrounding uplands. Ephemeral and intermittent stream systems comprise a large portion of southwestern watersheds, and contribute to the hydrological, biogeochemical, and ecological health of a watershed. Given their importance and vast extent, it is concluded that an individual ephemeral or intermittent stream segment should not be examined in isolation. Consideration of the cumulative impacts from anthropogenic uses on these streams is critical in watershed-based assessments and land management decisions to maintain overall watershed health and water quality."[14]

The BLM should include analysis of potential impacts associated with these issues in the final PEIS, as well as measures to avoid, minimize or mitigate such impacts.

[14] Levick, L., J. Fonseca, D. Goodrich, M. Hernandez, D. Semmens, J. Stromberg, R. Leidy, M. Scianni, D. P. Guertin, M. Tluczek, and W. Kepner. 2008. The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest. U.S. Environmental Protection Agency and USDA/ARS Southwest Watershed Research Center, EPA/600/R-08/134, ARS/233046, 116 pp.

V. Lands in Solar Development Program (SDP) alternative that are inappropriate for development

A significant portion of the area identified as open for solar development in the SDP Alternative is inappropriate for solar development and should be excluded from development. Beyond the need to exclude these areas from development under any alternative, the presence of these types of land in the SDP Alternative further underscores the need to select the SEZ Alternative and create a process for designating new zones as appropriate. We have included here a number of examples of areas within the SDP Alternative that are inappropriate for development.

In California, the SDP Alternative would permit development on a number of land designations with high conservation values. This alternative includes 1,766,543 acres of BLM managed lands in California while excluding lands with slopes greater than or equal to 5%, National Landscape Conservation System Lands, and the following additional areas: locations with solar insolation levels of less than 6.5 kWh/m2/day, Areas of Critical Environmental Concern, critical habitat for USFWS designated threatened and endangered species, Desert Wildlife Management Areas, Flat Tailed Horned Lizard, Coachella Valley Fringe-Toed Lizard and Mojave Ground Squirrel Designated Habitat, Right-of-Way Exclusion and Avoidance Areas, No Surface Occupancy Areas, and Special Recreation Management Areas. This approach results in a sprawling proposal that isolates existing conservation investments and precludes fragile desert biota connectivity. In addition, directing development only to lands with greater than 6.5kWh/m2/day insolation levels precludes opportunities to locate solar facilities on lands that are closer to load centers and/or are previously disturbed whose insolation values are lower than 6.5kWh/m2/day but still feasible for solar generation.

For example, the lands included in the Solar Development Program Alternative that are adjacent to the Pisgah SEZ to the east would impact existing occupied habitat for a robust population of the threatened desert tortoise, which currently provide a crucial genetic link between the existing conservation investments of the Ord-Rodman Desert Wildlife Management Area (DWMA), the Superior Cronese DWMA (both of which were established for desert tortoise conservation and recovery) and the Mojave National Preserve. Isolating these existing conserved areas will genetically isolate desert tortoises within them, lowering the biological fitness of this species that is currently sustaining significant population declines. In order to provide for recovery and maintain robust populations, inbreeding must be prevented by allowing for ample genetic connectivity and flow, which requires landscape scale connectivity. This is one of the reasons we support a comprehensive zone-based approach.

Additionally, over 400,000 acres of undisturbed private lands east of Pisgah were acquired with both public and private money (over $45 million) and donated to the Department of Interior for conservation purposes. The SDP alternative encompasses important lands within this conservation acquisition, including the proposed Mojave Trails National Monument (including the existing Amboy Crater National Natural Landmark) as well as the Castle Mountains potential addition to Mojave National Preserve and the Bowling Alley proposed wilderness addition to Death Valley National Park. The DRAFT PEIS fails to even mention these important conservation investments and fails to analyze the impacts of the proposal.

Another example of the failure of the DRAFT PEIS to identify important conservation overlays is the Wildlife Habitat Management Areas (WHMAs) that were established under the BLM's 2002 Northern and Eastern Colorado Plan Amendment[15] (Map 2-18, and Map 2-21). These WHMAs were identified in order to ensure desert bighorn sheep and other rare species' protection and connectivity. Numerous WHMAs are located within not only the SEZ but the Solar Development proposal areas. Because this important overlay was not even identified in the DRAFT PEIS, it also fails to analyze the avoidance and impacts these WHMAs.

Finally, another example of inappropriate inclusion of important biotic resources in the SDPA is sand transport corridors and regionally rare resources that they support which are detailed earlier in these comments. The SDPA fails to take into account the importance of these unique desert landscape features.

The conservation community has partnered with the DOI and others and worked hard to provide landscape level connectivity in the fragile California deserts. The Solar Development alternative will sacrifice the remaining opportunities by unsustainably developing key habitats and connectivity issues, yet the DRAFT PEIS fails to even identify these resources, provide reasonable alternatives or analyze impacts. Failing to do so here at the programmatic level, will cause significant problems and delays at the site specific level – problems and delays that could be avoided if adequately addressed in the DRAFT PEIS.

A. Citizens' Proposed Wilderness Lands

Citizens' Proposed Wilderness (CPW) lands are lands have been inventoried by various citizens groups, conservationists, and agencies and found to have ~~–~~wilderness characteristics," including naturalness, solitude and the opportunity for primitive recreation. Beyond these core values, these lands also provide important wildlife habitat, cultural and scientific resources, invaluable ecosystem services including clean air and water, important economic benefits, and many other resources and values. The sensitive nature of these lands and their resources and values makes their protection critical and solar energy development inappropriate for these lands.

By our analysis, significant acreages of Citizens Proposed Wilderness are included in both the preferred alternative and the Solar Energy Zone alternative for California: 94,408 acres of CPW lands are included in the Solar Energy Zone alternative and a total of 104,446 CPW acres are included in the preferred alternative. These lands have been identified as suitable for wilderness designation and are not appropriate for solar development. A chart and map detailing these overlaps are provided as **Appendix B.**

B. Ivanpah Valley

The Ivanpah Valley in California's San Bernardino County and Nevada's Clark County is an important and sensitive ecosystem. The area is an extremely good example of lands not suitable as a SEZ and should be removed from BLM's inventory of potentially suitable lands and **from further consideration for solar energy development projects due to the high occurrence of sensitive resources, the vulnerability to cumulative impacts, and general inconsistency with**

[15] http://www.blm.gov/ca/news/pdfs/neco2002/

criteria for siting solar facilities in the desert.

Conservation organizations are preparing a report detailing the significant ecological and cultural values in the Ivanpah Valley that would be unnecessarily degraded by additional renewable energy development on public lands, but among them are:

- Rich with diverse plant and animal life, including addition a healthy population of desert tortoises, rare plant species, several rare bat species, the elusive and rare Gila monster, and rare bird species, including golden eagles, and desert bighorn sheep, who traverse the valley when traveling among the surrounding mountain peaks.
- Vulnerability to loss of scarce groundwater, drawing down water tables and harming wildlife.
- Impacts on [adjacent] Mojave National Preserve. Among the consequences would be loss of scenic views, diversion of water from the preserve, and obstruction of a wildlife corridor that allows wildlife to move between the preserve and other protected areas.
- Presence of areas sacred to Native American people.

Although BLM issued a permit in this area to Brightsource for a 370 MW project in this area in 2010, it is not an appropriate area for intensive solar energy development. Analysis of the Ivanpah Solar Project revealed that, in combination with foreseeable future projects, it would result in adverse and unavoidable cumulative visual impacts and represent a substantial change and impairment of a natural landscape that is largely intact.

We recommend removing the Ivanpah Valley from future consideration for solar development due to the high occurrence of sensitive resources, vulnerability to cumulative impacts, and general inconsistency with criteria for siting solar facilities in the desert.

VI. Solar Energy Zones

The proposed SEZs in California include two areas with the potential to be appropriate SEZs (Imperial and East Riverside), and two areas that are inappropriate for designation as SEZs (Iron Mountain and Pisgah). The SEZ analysis in California fails to consider areas in the West Mojave and Chocolate Mountain areas that the conservation community has previously proposed to the Bureau of Land Management for consideration. Maps of these areas are included as **Appendix C and D**. Please see the detailed comments below for more information on the proposed SEZs in California, including details on our potential support for two of the SEZs.

We have included a significant amount of information regarding the SEZs, including recommended boundary revisions and exclusion areas, areas where additional analysis is needed, and flags of sensitive resources that will need to be addressed with further site-specific, project-level review, opportunities for responsible development, recommended mitigation measures, and corrections.

These recommendations are intended to help the BLM make the SEZs as useful as possible in

facilitating responsible and efficient permitting of projects there. The recommendations are not intended to convey general opposition to the SEZs. Rather, it is our hope that if the BLM follows our recommendations, the agency may be able to complete additional analyses necessary to allow projects to more effectively tier environmental reviews to the PEIS, and ultimately facilitate efficient and responsible development there.

Though the volume of information included on the SEZs may appear to indicate that the SEZs are generally problematic, and there are in fact significant concerns about a few of the SEZs, we strongly caution against interpreting the detailed nature of these comments to imply opposition to the SEZs across the board. Rather, we underscore the importance of focusing on the SEZs rather than the additional acreage included in the SDP Alternative in California. The SEZs have already benefited from significant screening and analysis, and we believe that the issues raised below can be addressed by following our recommendations to allow efficient and responsible development in the SEZs. The SDP Alternative has not benefitted from this screening and analysis. Beyond the specific issues raised for these lands in Section IV, we expect that volumes of additional issues and challenges would be found on many of the SDP Alternative lands were they subjected to the scrutiny that the SEZs have seen.

The BLM has identified 339,090 acres in four Solar Energy Zones in the desert region of southern California. Of these four zones, two have very high levels of resource conflicts which are detailed below, and two are more appropriate for development. One of those two, East Riverside, would benefit from recommended modifications included in these comments below. In addition, we strongly encourage the BLM to look at the possibility of creating additional zones in the West Mojave and the Chocolate Mountains area as additional lands are needed for solar development over time. The BLM should also assess the possibilities for conjunctive use of BLM lands with adjacent private lands through the DRECP process in which counties can identify appropriate private lands for solar development.

Each of the four current proposed zones are analyzed below

Imperial SEZ

I. Overview

The proposed Imperial East solar energy zone (SEZ) has a total area of 5,722 acres and is located in Imperial County in southeastern California, near the United States–Mexico border. I-8 runs east–west along the northeast edge of the proposed SEZ, while State Route 98, a two-lane highway, passes through the southern edge. San Diego lies 120 miles to the west, and Yuma, Arizona, 29 mi (47 km) to the east via I-8. A 115-kV transmission line intersects the southwest corner of the SEZ, and a 500-kV line is located about 0.4 mi to the south, running east-west.

The zone has comparatively low resource values in addition to characteristics that make it appropriate for development, namely existing transmission and road infrastructure, and we support the designation of this area as a SEZ provided the BLM considers our concerns and incorporates our recommendations into the final siting, design and mitigation measures.

II. Sensitive Natural Resources and Recommended Additional Analysis

i. Overarching issues the BLM must address:

Water

The California desert is an extremely arid environment. Many of the basins that contain excellent solar resources are not adjudicated and are already in overdraft. Given the importance of water for proper ecosystem function, it is critical that the BLM ensures that solar development does not allow unacceptable impacts to water resources and the ecosystems, habitat and species that depend on them.

The Imperial SEZ does not have any perennial surface waters, but does have several ephemeral streams and intermittent ponds.

ii. Recommended boundary adjustments

At this time we are not recommending any boundary adjustments to the Imperial SEZ.

iii. Issues requiring special attention at project-level review

Wildlife

While we support the designation of the Imperial SEZ, there are still many mitigation measures that should be implemented to minimize possible negative impacts on local wildlife. All of the mitigation measures in Volume 1, Chapter 5, section 5.10.5, as well as in Table 5.10-2 and the Programmatic Design Features in Appendix A, section A.2.2 should be made requirements for development by the BLM (in addition to the measures which are required by other federal laws like the Endangered Species Act).

Flat-tailed Horned Lizard: The presence of Flat-tailed Horned Lizard in the SEZ area requires particular attention in both the PEIS and project level review. The proposed Imperial SEZ falls within the BLM-designated East Mesa Flat-tailed Horned Lizard Wildlife Habitat Management Area (70) (CDCA Plan, Map. No.3 Planned Management Areas for Fish and Wildlife). Management directives for this area are contained in Table 2, Planned Management Areas for Fish and Wildlife. Although Map. No. 3 appears to identify Management Area 70 only as an Area of Critical Environmental Concern (ACEC); it is associated with the Wildlife Habitat Management Area and the ACEC. Table 2 confirms this dual-management area designation.

Furthermore, in 2003, BLM and numerous other agencies approved the Flat-tailed Horned Lizard Rangewide Strategy as a means to conserve this at-risk species throughout its currently occupied range, with conservation emphasis targeted at four designated management areas. This management strategy confirms that BLM prepared and has implemented specific plans for conservation of the Flat-tailed Horned Lizard and its habitat, including the following that overlap the proposed Imperial East Solar Energy Zone: the "Southern East Mesa ACEC Management Plan" (BLM 1982a) and "East Mesa Wildlife Habitat Management Plan" (BLM 1982b), both of which were completed in 1982. The two plans covered adjacent areas and included similar measures.

The Flat-tailed Horned Lizard Rangewide Management Strategy[16] contains approved measures regarding proposed multiple land use activities that BLM should adopt as SEZ-specific design features in the analysis and mitigation strategy proposed by BLM for this SEZ:

> *Within FTHL habitat, the area of disturbance of vegetation and soils shall be the minimum required for the project. [If possible, specify a maximum disturbance allowable based on the specifics of the project.] Clearing of vegetation and grading shall be minimized. Wherever possible, rather than clearing vegetation and grading the ROW, equipment and vehicles shall use existing surfaces or previously disturbed areas. Where grading is necessary, surface soils shall be stockpiled and replaced following construction to facilitate habitat restoration. To the extent possible, disturbance of shrubs and surface soils due to stockpiling shall be minimized.*
>
> *Within and outside of MAs, limit the loss of habitat and effects on FTHL populations through the application of effective mitigation and compensation.*
>
> *Outside of (the management areas) FTHL habitat receives a degree of protection through mitigation and compensation and through the previously established habitat management plans that affect public lands outside of (the management areas) (Appendix 2). Specifically, signatories to the conservation agreement ensure that adverse effects of projects they authorize outside of (management areas) are mitigated and that residual effects are compensated in accordance with a standard formula (see Mitigation and Compensation). The funds obtained through compensation are used to consolidate land ownership within the (management areas) or to enhance habitat.*
>
> *Activities in potential habitat corridors between MAs and the RA shall be regulated or mitigated so that at least occasional interchange of FTHLs occurs among adjacent populations. Potential habitat corridors include lands between West Mesa and Yuha Desert MAs and between West Mesa MA and Ocotillo Wells RA (see Corridors). In addition, activities in the Yuha Desert and Yuma Desert MAs that would prevent interchange of FTHLs across the International Border shall be prohibited.*

The BLM must analyze to the maximum extent possible the effect of designating an Imperial East SEZ on the Flat-tailed Horned Lizard and through the management policy framework established for this species and its habitat through the Flat-tailed Horned Lizard Rangewide Management Strategy. Furthermore, any mitigation measures proposed for solar development activities within this SEZ must conform to the policies established in the management strategy. In addition, the BLM must adopt SEZ-specific design features for the Imperial SEZ that conform with The Flat-tailed Horned Lizard Rangewide Management Strategy.

[16]Flat-tailed Horned Lizard Interagency Coordinating Committee. 2003. Flat-tailed horned lizard rangewide management strategy, 2003 revision. 78 pp. plus appendices.

Golden Eagle: The PEIS accurately predicts the presence of Golden Eagles in all four proposed SEZs in California, including the Imperial SEZ. As mentioned in the introduction to these comments, golden eagle (*Aquila chrysaetos*) is a fully protected species under The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). BLM should require solar developers to follow USFW Interim Golden Eagle Technical Guidance Protocols of March 25, 2010 in determining the presence of Golden Eagle on a project site and within a 10 miles radius outside of a project site in consultation with USFW Service and CDFG.

Cumulative Impacts

The proposed SEZ lies in East Mesa, within the CDCA and the Sonoran Desert. In 2008, the county population was 180,493, while the surrounding two-county region in Imperial County and Yuma County, Arizona had a total population of 387,798.

The greatest source of likely cumulative impacts is other renewable energy projects – solar, wind and geothermal – and associated infrastructure such as substations and gen-tie transmission lines. In addition to the proposed solar and wind projects, the EIS for the Imperial Valley Solar Project, located near the proposed SEZ, identified eight mixed use residential and commercial development projects, the pedestrian border fence, continued growth of use of open OHV areas, and several other projects that could also contribute to cumulative impacts in the SEZ, id. B.3-10. While not all of these projects are being permitted by the Bureau, all reasonable efforts must be made to obtain information regarding their potential impacts and construction timing so that a full picture of cumulative impacts can be presented in the final PEIS.

Cultural and Historic Resources

The DRAFT PEIS affirms that only one archaeological survey has been conducted within the Imperial East SEZ in the northwest corner of the SEZ, according to GIS data available from the El Centro Field Office. No sites within the SEZ were recorded from that survey; however, several sites were recorded northwest of the SEZ. Two sites within the SEZ are identified adjacent to State Route 98. The PEIS also recounts that the archaeological work conducted in the area is primarily associated with the All-American Canal Lining Project in the early 1990s. According to the 1994 Final Environmental Impact Statement for the project, the area along the canal south of the SEZ is an area of known high density of both prehistoric and historic cultural resources.

In light of the potential for additional cultural and historic sites in the vicinity of the proposed zone, and the lack of survey information within the zone, we are recommending a two-phased approach to increase the quality and amount of data in a relatively cost effective and timely manner. The first is to develop a predictive model using existing data from surrounding areas within the same physiographic and cultural areas. The model should allow the agency to better extrapolate what kinds, location, and quality of sites will likely occur in the SEZs in areas that are to be inventoried. The second part includes completing a sample survey to bring the percentage of the inventory up. This will help

the agency with selection and boundary adjustments before the final PEIS is completed. The agency will be more likely to predict issues that may arise during the required Section 106 compliance. This will also assist the developer to avoid areas that are likely to contain significant cultural resources and the subsequent costs of data recovery or project adjustment.

In addition the environmental review for any projects permitted within approved SEZs must include the complete assessment, avoidance and mitigation of cultural impacts, rather than conducting the cultural resource analysis separately and outside of the public review process. Any need for confidentiality regarding specifics of cultural and historic resources would of course be honored during this review.

iv. **Opportunities for environmentally responsible solar development**

I-8 runs east–west along the northeast edge of the proposed SEZ, while State Route 98, a two-lane highway, passes through the southern edge. The All-American Canal runs parallel to the southern boundary of the proposed SEZ, about 0.3 mi (0.5 km) from the boundary. Two hydropower facilities exist along the canal, along with associated dams and substations.

A 115-kV transmission line intersects the southwest corner of the proposed SEZ, and a 500-kV line is located about 0.4 mi (0.6 km) to the south, running east-west. There is an operating geothermal plant about 3 mi (4.8 km) northwest of the proposed SEZ. The existence of highway access and transmission capacity provide opportunities for solar development with limited needs for additional major infrastructure. We encourage BLM to ensure developers utilize existing infrastructure to the extent possible.

Riverside East

I. Overview

The Riverside East SEZ is the largest of all the proposed SEZs, with a total area of 202,896 acres (821 km^2). It is located in Riverside County in southeastern California, within the Chuckwalla Valley and the southern portion of Palen Valley. The eastern portions of the proposed SEZ are located in the Palo Verde Mesa and McCoy Wash watershed. The eastern boundary of the SEZ is about 6 mi (10 km) west of the Arizona border. The western boundary abuts and surrounds a portion of Joshua Tree National Park.

This proposed zone has 15 pending project applications. In addition, two large scale solar projects were permitted inside the proposed zone this past year, and two more large scale solar projects are likely to be permitted in 2011 prior to the completion of the Solar PEIS.

While the BLM is projecting an 80% buildout scenario for the purposes of analyzing the zone, the issue that needs to be analyzed in the PEIS is the actual carrying capacity of the zone given the current level of project activity. More precisely, the BLM must look at what level of development can be accommodated without causing unacceptable impacts to wildlife and wildlands and other desert resources. In order to answer this question, further analysis is needed

on opportunities and constraints within the zone with respect to landscape level processes and functions like connectivity and sand transport.

Provided the appropriate boundary modifications and exclusion areas are made and the concerns below can be addressed at a project-specific level, we support the designation of this area as a Solar Energy Zone.

Sensitive Natural Resources and Recommended Additional Analysis

i. Overarching issues

Current Data

Biological resources information on species and their habitats within and adjacent to the proposed zone needs to be updated based on EISs for large-scale solar projects within the region that were approved by BLM in 2010 and for those under consideration for approval in 2011. This information is associated with the following proposed and already permitted solar energy projects: Solar Millennium Blythe, Solar Millennium Palen, Genesis Ford Dry Lake, and Desert Sunlight. Combined, the environmental study area for these projects includes approximately 20,000 acres of public land, and the detailed biological inventory data and reports compiled for these projects should be used in preparing an updated understanding of habitats and species that occur within the proposed zone, and the analysis of impacts.

Water

The California desert is an extremely arid environment. Many of the basins that contain excellent solar resources are not adjudicated and are already in overdraft. Given the importance of water for proper ecosystem function, it is critical that the BLM ensures that solar development does not allow unacceptable impacts to water resources and the ecosystems, habitat and species that depend on them.

In the proposed Riverside East SEZ, there is a large, dry wash on the northwestern boundary that functions as an ephemeral stream, the large McCoy Wash is located in the eastern portion of the proposed SEZ, and the National Wetlands Inventory has identified freshwater emergent wetlands and riverine wetlands within the SEZ. The DRAFT PEIS appears to call for—but not require –Avoidance of wetlands within the SEZ". And specifically –Ground disturbance near McCoy Wash, Palen Lake, Ford Dry Lake and wetlands should be avoided or minimized to the extent practicable." We support this concept but recommend that the BLM require this avoidance rather than merely suggest it.

Biological Connectivity

In addition to analyzing internal wildlife corridors, the PEIS needs to address the issue of north south connectivity across the Riverside East SEZ. This is especially important in view of the linear nature of the SEZ, in combination with its sheer size. The analysis should not only consider the current movement patterns within and

across the SEZ, but also the landscape level areas that will likely be necessary to ensure flora and fauna within and without the SEZ can move and adapt to climate change. Given the avoidance areas, needed migration corridors and other resources within the Riverside East Zone, the PEIS should be changed to reflect that less than 80% of the SEZ can/will be developed.

ii. Recommended boundary adjustments and exclusion areas

In order to avoid significant impacts to important desert resources, the following types of lands in the Riverside East SEZ should be excluded from development:

- Microphyll Woodlands, especially in McCoy Wash watershed, Chuckwalla Valley and Palen Valley
- Wildlife Habitat Management Plan Areas
- Sand Dunes and Sand Transport Corridors
- Habitat Connectivity Areas

The BLM should exclude the above types of lands from development in the Riverside East SEZ using as a guide BLM documents such as, but not limited to, the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO) Plan and publicly available sand transport studies (a list is provided as **Appendix F**).

Microphyll Woodlands: As proposed, this SEZ overlaps Wildlife Habitat Management Areas designated in the CDCA Plan, and would heavily impact Microphyll Woodlands found in washes located within the SEZ. These woodlands are classified as an Unusual Plant Assemblage in the CDCA Plan. In order to minimize impacts to Microphyll Woodlands, we recommend that the BLM adjust the eastern and northeastern boundary to avoid the McCoy Wash watershed, and the northwestern boundary to exclude the Microphyll Woodlands in upper Chuckwalla Valley and Palen Valley.

Wildlife Habitat Management Areas: In addition, BLM should create exclusion areas for the Wildlife Habitat Management Plan Areas identified in the CDCA Plan that fall within the SEZ boundary.

Sand Dunes and Sand Transport Corridor: The Riverside East SEZ in California also encompasses a large sand transport corridor that has already caused significant project reconfigurations for three solar projects and at least one substation. The sand transport corridor and sand dunes in the Riverside East SEZ represent the southernmost range of the Mojave fringe-toed lizard. The population in the southern most part of its range is unique because it survives at the lowest elevation and with the least amount of precipitation, adaptations that will serve the species well in light of global climate change. The northern range – Amargosa River Distinct Population Segment of the Mojave fringe-toed lizard (*Uma scoparia*) is already the subject of a petition for Endangered Species Act protection due to threats from off-road vehicles and other factors.[17] Futher impacts to the sand habitat and sand transport corridors in the range of the lizard may require additional

[17] http://www.biologicaldiversity.org/species/reptiles/Mojave_fringetoed_lizard/endangered_species_act_profile.html

Endangered Species Act protection for this species. The sand transport corridors within the Riverside East SEZ, including those already identified through project specific analyses (see Genesis Solar Energy Project PA/FEIS, August 2010; and Worley Parsons 2010c and OTHERS) should be excluded from the SEZ.

In addition, we recommend that the BLM assess opportunities for conjunctive use with low-resource private lands adjacent to the proposed Riverside East SEZ.

iii. Issues requiring special attention at project-level review

Biological Resources

While we support the designation of the Riverside East SEZ contingent upon BLM incorporating our recommendations into the final siting, design and mitigation measures, there are still many mitigation measures that should be implemented to minimize all possible effects on local wildlife. All of the mitigation measures in Volume 1, Chapter 5, section 5.10.5, as well as in Table 5.10-2 and the Programmatic Design Features in Appendix A, section A.2.2 should be made requirements for development by the BLM (in addition to the measures which are required by other federal laws like the Endangered Species Act).

Four special status species that will require particular attention in the proposed Riverside East SEZ are the desert tortoise and bighorn sheep, Mojave fringe-toed lizard (state) and Golden Eagle. There is Desert Tortoise Critical Habitat outside of designated ACECs in the western and southern areas of the SEZ. In addition, there are connectivity and biological linkages for desert tortoise between the Northern Colorado and Eastern Colorado Recovery Units and between the Chuckwalla and Chemehuevi Critical Habitat Units.

The proposed SEZ has also been identified as a probable bighorn sheep movement corridor and the final PEIS must address this issue in its analysis of the biological resources in the Riverside East SEZ. The proposed SEZ is also traversed by sand dunes supporting Mojave fringe-toed lizard and other sensitive sand-dependent species. The DRAFT PEIS is lacking in its assessment of this species, the sand dunes and the ecosystem processes that support the sand dune system.

The PEIS accurately predicts the existence of golden eagle in the proposed Riverside East SEZ. As mentioned in the introduction to these comments, the golden eagle (*Aquila chrysaetos*) is a fully protected species under The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). BLM should require solar developers to follow USFW Interim Golden Eagle Technical Guidance Protocols of March 25, 2010 in determining the presence of Golden Eagle on a project site and within a 10 miles radius outside of a project site in consultation with USFW Service and CDFG. Take of Golden eagles and other raptors protected by the Migratory Bird Treaty Act should be avoided. The PEIS is notably lacking in its assessment of this species.

Cumulative Impacts

The proposed Riverside East SEZ is located in Riverside County in southeastern California, within Chuckwalla Valley and the southern portion of Palen Valley. The eastern portions of the proposed SEZ are located in the Palo Verde Mesa and McCoy Wash watershed and the entirety of the zone is located in the California Desert Conservation Area (CDCA).

The eastern boundary of the site is about 6 mi (10 km) west of the Arizona border. The western boundary abuts and surrounds a portion of Joshua Tree National Park. In 2008, the county population was 84,443. The closest large cities are Moreno Valley, San Bernardino, and Riverside (all located slightly more than 100 mi [161 km] west of the proposed SEZ on I-10). While there may be some development pressure from desert communities, the most likely source of cumulative impacts in the Riverside East SEZ is from solar and wind projects and associated infrastructure such as new substations and transmission.

As previously discussed in the overview of the Riverside East SEZ, this area is already heavily subscribed with applications for renewable energy projects and if these projects move forward there will undoubtedly be cumulative impacts from power generation in addition to other non-energy related activities being proposed for the area.

Cultural and Historic Resources

The Riverside East SEZ has many cultural and archaeological resources not all of which have been documented. In light of the potential for additional cultural and historic sites in the vicinity of the proposed zone, and the lack of survey information within the zone, we are recommending a two-phased approach to increase the quality and amount of data in a relatively cost effective and timely manner. The first is to develop a predictive model using existing data from surrounding areas within the same physiographic and cultural areas. The model should allow the agency to better extrapolate what kinds, location, and quality of sites will likely occur in the SEZs in areas that are to be inventoried. The second part includes completing a sample survey to bring the percentage of the inventory up. This will help the agency with selection and boundary adjustments before the final PEIS is completed. The agency will be more likely to predict issues that may arise during the required Section 106 compliance. This will also assist the developer to avoid areas that are likely to contain significant cultural resources and the subsequent costs of data recovery or project adjustment.

In addition the environmental review for any projects permitted within approved SEZs must include the complete assessment, avoidance and mitigation of cultural impacts, rather than conducting the cultural resource analysis separately and outside of the public review process. Any need for confidentiality regarding specifics of cultural and historic resources would of course be honored during this review.

Specific cultural and historic resources likely to be impacted in the proposed Riverside East SEZ include:

- prehistoric habitation sites, mesquite processing sites and lakeshore sites in the Sidewinder Well ACEC and Palen Dry Lake ACEC[18]
- Colorado Desert aboriginal trails
- Possible Papago Creation site north of Desert Center[19]
- Portions of historic Camp Rice (World War II Desert Training Center) that has been recommended eligible for the National Register of Historic Places[20]

In addition, the South McCoy Mountains and Ford Dry Lake may contain important cultural resources.

III. Opportunities for environmentally responsible development

I-10 runs east–west along the southern boundary of the SEZ, State Route 177 runs north–south through the western section, and Midland Road crosses the northeastern portion of the SEZ. U.S. 95 runs north–south about 3 mi (5 km) from the eastern boundary of the SEZ. An existing 500-kV transmission line runs east-west along I-10 and parallel to the southern proposed SEZ boundary. In addition, a 230-kV line passes through the far western section of the proposed SEZ, a 69-kV line passes through the eastern portion of the proposed SEZ, along with other transmission lines.

The proximity of major interstates and existing and approved (Devers II) transmission infrastructure provide opportunities for solar development with limited needs for additional major infrastructure. We encourage BLM to ensure developers utilize existing infrastructure to the extent possible. In addition we encourage the Bureau to incorporate conjunctive use with existing adjacent converted lands within the SEZ.

Pisgah SEZ

I. Overview

This proposed SEZ is comprised of 23,950 acres of public land within the central Mojave Desert region. This area is a focal point of biological landscape connectivity between the western and eastern Mojave Desert Regions and is rich in biological resources. As such it is regionally significant in sustaining biological diversity and gene flow at the landscape level. The

[18] Mojave Desert Land Trust. (2008). *A Constraints Study of Cultural Resource Sensitivity within the California Desert*. Unpublished manuscript. p. 34. Attachment C.
[19] Location has been identified based upon public concern for the location. Research regarding the site needs to be conducted. Mojave Desert Land Trust. (2008). p.45.
[20] Part of the World War II (WWII) Desert Training Center/ California–Arizona Maneuver Area

description of the affected environment and impacts of proposed development in the DRAFT PEIS are not based on the best available information for this specific area.

Recent surveys associated with solar projects permitted in 2010 confirmed that solar development in this area would entail loss of habitat and displacement of many wildlife species, including the state and federally threatened desert tortoise, special-status reptiles, special-status mammals, migratory birds, and numerous rare plant species. **The BLM should remove the proposed Pisgah SEZ from further consideration because of its location within an area of essential habitat connectivity.** Designation of this area as a SEZ is incompatible with the BLM's conservation responsibilities under the Endangered Species Act, Federal Land Policy and Management Act, and its own wildlife resource manuals. While we believe strongly that the Pisgah SEZ is not appropriate for development of solar energy, we do recommend that the BLM consider a limited base of lands near the Pisgah Zone identified as the Daggett Triangle in **Appendix C**. These lands were identified by environmental stakeholders in 2009 as potentially appropriate for development and should be assessed in conjunction with adjacent private lands, potentially through the DRECP process.

II. Sensitive Natural Resources and Recommended Additional Analysis

i. Overarching issues

Current Data

Not reflected in the DRAFT PEIS for this proposed zone is the BLM's approval of the Calico Solar Energy Project in 2010 and the abundant documentation of biological resources within the much of the proposed zone that were identified during Final EIS for the Calico project. Incorporated by reference are the entire CEC proceedings on the Calico project. Specifically, in order to designate this SEZ, the PEIS should address new information for the occurrence, distribution, habitat quality, and habitat connectivity for the following 12 Special Status Species: Emory's Crucifixion-thorn, Small-flowered Androstephium, White-margined Beardtongue, Arroyo Chub, Mohave Tui Chub, Desert Tortoise, Mojave Fringe-toed lizard, Southwestern Pond Turtle, Burrowing Owl, Golden Eagle, Bendire's Thrasher, and Nelson's Bighorn Sheep.

Water

The California desert is an extremely arid environment. Many of the basins that contain excellent solar resources are not adjudicated and are already in overdraft. Given the importance of water for proper ecosystem function, it is critical that the BLM ensures that solar development does not allow unacceptable impacts to water resources and the ecosystems, habitat and species that depend on them.

The Pisgah SEZ specifically contains a significant drainage from the Cady Mountains that has not yet been mapped by the National Wetlands Inventory. This unmapped drainage should be further analyzed, including its importance for the numerous special status species in the vicinity.

Conservation Lands

The proposed SEZ includes between 775 and 1700 of donated lands or lands acquired with Land and Water Conservation Fund (―LWCF") funds. We are extremely concerned that LWCF lands are included in the proposed SEZ and wary of the precedent it sets for future projects on BLM lands. The use of donated and acquired lands is not just bad policy; it is contrary to the intent of the land donors and the public, and a violation of BLM guidance:

> *Lands acquired by BLM under donation agreements, acquired for mitigation/compensation purposes and with LWCF funds, are to be managed as avoidance/exclusion areas for land use authorizations that could result in surface disturbing activities.*[21]

Wildlife and Flora

The proposed Pisgah SEZ is rich in biological resources and project surveys for the recently permitted Calico solar project have provided additional, more current data on biological resources than was previously available to the BLM. The proposed Pisgah SEZ falls within an area of essential habitat connectivity that links together the Desert Tortoise Recovery Units in the Western Mojave, Eastern Mojave and Northern Colorado deserts. Furthermore, this habitat connectivity area links the natural landscape blocks and native species occurring in the Bristol, Cady, Rodman, Newberry and Ord Mountain areas.

Desert Tortoise: The importance of the area for the recovery of the desert tortoise was reflected in the biological opinion for the Calico solar project issued by the U.S. Fish and Wildlife Service (USFWS) on 10/15/2010. This opinion contains important information about the Desert Tortoise and its habitat within the proposed Pisgah SEZ that is very relevant to the development of the solar PEIS.

In its opinion on the Calico Solar Project, the USFWS advised BLM of recommended conservation measures for the Desert Tortoise intended to promote the recovery of this federally threatened species. Specifically, the Service's recommendation states:

> *We recommend that the Bureau amend the California Desert Conservation Area Plan to prohibit further large-scale development (e.g., solar energy facilities, wind development, etc.) within the Pisgah Valley. We offer this recommendation because the Fish and Wildlife Service has determined that maintaining a functional corridor through the Pisgah Valley is critical for the long term recovery of the desert tortoise. The importance of this corridor is heightened given the need to allow for the shifting distribution of the desert tortoise and the potential adverse effects of climate change (Service 201 Of). While re-design of this project has reduced adverse effects to connectivity, given the uncertainty surrounding*

[21] Bureau of Land Management. 2009. Instruction Memorandum No. CA-2009-020 (May 27, 2009): Interim Policy on Management of Donated Lands and Lands Acquired with Land and Water Conservation Funds (LWCF). California State Office, Sacramento, California. 2 pp.

this issue, and the critical nature of this connection, we believe a conservative approach is warranted.

Surveys conducted for the proposed Calico Solar Project site revealed a very dense and thriving population of juvenile and adult desert tortoises within the proposed Calico Solar Project footprint.[22] CEC Staff estimated that the 6,215 acre site likely contained approximately 189 adult and juvenile desert tortoises, and the total population on site could be as high as 281 tortoises. In addition, CEC Staff estimated that 436 eggs were present in the project footprint. Desert tortoise densities in the northern portion of the proposed Calico Solar Project are very high and well over the average tortoise density of 4.7 tortoise/km^2 identified by the West Mojave Plan.

The area surveyed as part of the Calico Solar Project process represents only a portion of the proposed Pisgah SEZ. It is very likely that that the dense population of desert tortoise discovered on the Calico Solar Project site extends throughout the Pisgah Valley.[23]

In addition to the direct impacts to desert tortoise populations, development of the proposed Pisgah SEZ would cut off critical habitat corridors that are essential for desert tortoise connectivity. During the Calico Solar Project hearings, the U.S. Fish and Wildlife Service and other wildlife experts identified the Pisgah Valley as an important connectivity corridor between populations for several important desert tortoise recovery areas. CEC Staff testified that the Project would fragment habitat by severing linkages and impeding north-south habitat movement for species such as the desert tortoise. Critical desert tortoise habitat exists directly adjacent to the proposed Pisgah SEZ in the Newberry-Rodman DWMA, which is directly southwest of the Pisgah Valley. Development in the proposed Pisgah SEZ would completely sever connectivity between desert tortoise populations in this critical habitat from the dense populations of desert tortoise identified in the northern portion of the Pisgah Valley near the base of the Cady Mountains.[24] Fragmenting these populations would threaten the long-term genetic viability of the desert tortoise as a species.

Bighorn Sheep: Development of the proposed Pisgah SEZ would result in significant impacts to Nelson‘s bighorn sheep, a federal sensitive species. Signs of bighorn sheep were observed within the proposed Pisgah SEZ, and the area is also important for the regional movement of bighorn sheep across its range in the Mojave. During the Calico Solar Project proceeding, expert testimony on bighorn sheep explained the importance of this regional movement:

The project site is on a direct line between the south end of the

[22] CEC Staff‘s Second Errata to the Supplemental Staff Assessment, August 17, 2010, pp. 2-6, available at: http://www.energy.ca.gov/sitingcases/calicosolar/documents/index.html.
[23] Cashen, Scott Rebuttal Testimony, Exhibit 424 (CURE), p. 6, available at http://www.energy.ca.gov/sitingcases/calicosolar/documents/index.html.
[24] The BNSF rail-line and Interstate 40 do not currently sever connectivity for desert tortoise because several large trestles, culverts and bridges allow for tortoise mobility underneath the rail-line and road in multiple locations along the southern edge of the Pisgah Valley.

> *Cady Mountains and the north end of the Rodman Mountains. And connectivity among these [metapopulations] that we have been talking about, including the Cady Mountains…is contingent upon continued connectivity. So there is the potential for this project to disrupt metapopulation function and movement from the Cady Mountains to the south, and equally importantly, from the Rodman Mountains northward to the Cady Mountains.*[25]

The Cady Mountains are an essential linkage corridor for both the bighorn sheep and other species.[26] A population of at least 300 bighorn sheep inhabits the Cady Mountains to the north of the proposed Pisgah SEZ. This group represents the westernmost subpopulation of bighorn sheep in the Central Mojave Metapopulation and, because of its size, has a greater potential to produce emigrants than most other subpopulations that comprise the Central Mojave Metapopulation. It is also the closest large population to the Newberry Mountains and Ord Mountains, which lie southwest of the proposed Pisgah SEZ, albeit on the south side of Interstate Highway 40 (and which should not be considered a total barrier to movement, based on observations of bighorn crossing such partial barriers elsewhere). Development of the Pisgah SEZ has the potential to impact animals immigrating into the Cady Mountains from the Newberry or Ord Mountains. Emigration, immigration, and gene flow are necessary components of metapopulation function, and likely occur at low rates within metapopulations of bighorn sheep. Development of the proposed Pisgah SEZ would sever one of the few remaining corridors between the Western Mojave Metapopulation and the Central Mojave Metapopulation, thereby negatively impacting the species as a whole.[27]

Golden Eagle: The DRAFT PEIS accurately predicts the existence of golden eagle in the proposed Pisgah SEZ. As mentioned in the introduction to these comments, golden eagle is a fully protected species under The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). BLM should require solar developers to follow USFW Interim Golden Eagle Technical Guidance Protocols of March 25, 2010 in determining the presence of Golden Eagle on a project site and within a 10 miles radius outside of a project site in consultation with USFW Service and CDFG.

Mojave Fringe-Toed Lizard: The Mojave fringe-toed lizard is a BLM sensitive species and a California species of special concern. It has very specific habitat needs and persists only on habitat that contains fine sands. The Mojave fringe-toed lizard exists in genetically distinct population lineages at isolated locations, such as the Pisgah Valley. Therefore, development in the proposed Pisgah SEZ would have significant adverse impacts on a distinct and unique species. During the Calico Solar Project proceeding,

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[25] Bleich, Hr'g Tr., Aug. 5, 2010, p.307, available at: http://www.energy.ca.gov/sitingcases/calicosolar/documents/index.html.

[26] Spencer, W.D., et. al., 2010, *California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California*. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highway Administration.

[27] Bleich, Hr'g Tr., Aug. 5, 2010, p.307, available at: http://www.energy.ca.gov/sitingcases/calicosolar/documents/index.html.

CEC Staff concluded that the project would result in the extirpation of an entire population of Mojave fringe-toed lizards in the Pisgah Valley. The Pisgah SEZ also includes an important sand transport area linking the Mojave River Valley and Troy Dry Lake with the Pisgah region that is occupied by the Mojave Fringe-toed Lizard, as documented in the Calico Solar Project FEIS/SA.[28]

Rare Plants: The Pisgah SEZ is particularly rich in rare plant species and contains very good occurrences of white margin beard tongue in northeastern part of the proposed zone and in the adjacent Lavic Lake/Pisgah Crater. Other rare and special status plant species noted in an ecological assessment conducted by The Nature Conservancy (TNC) include Androstephium breviflorum, and Castela emory, a CNPS-listed species.

The white-margined beardtongue (*Penstemon albomarginatus*) is an exceedingly rare desert flower that exists in only a few scattered locations. The Pisgah Valley is one of those locations. Development in the proposed Pisgah SEZ would result in significant impacts to white-margined beardtongue, which is listed as a California Native Plant Society ~~–~~1B" special status species. The California Native Plant Society has stated that the proposed Calico Solar Project, which is within the Pisgah SEZ, may significantly contribute to the extinction of the species because the project would fragment and isolate the few remaining populations of white-margined beardtongue. Further development in the Pisgah SEZ would only exacerbate this danger.

Cultural and Historical Resources
Sensitive cultural resources sites are present within the Pisgah SEZ, including trails out of the Cady Mountains towards Cronese Dry Lake and obsidian chipping sites. Troy Lake on the western edge of the SEZ has not been surveyed to professional standards. This area contains geoglyphs, habitation sites, lithic scatters, rock art, and isolated hearths on both sides of Interstate 40. Troy and Cronese Dry Lakes need to be thoroughly inventoried. Research regarding the site needs to be conducted.[29]

ii. Recommended boundary adjustments

We recommend that this study area be removed entirely from consideration due to the high level of resource conflicts that render the zone un-suitable for solar development.

iii. Issues requiring special attention at project-level review

The issues of connectivity and habitat linkage that make the Pisgah SEZ unsuitable for development cannot be sufficiently addressed at the project level and our recommendation is that the zone be removed from consideration and that no project applications should be allowed to be filed in this area.

III. Opportunities for environmentally responsible development

[28] http://www.energy.ca.gov/sitingcases/calicosolar/documents/index.html
[29] Mojave Desert Land Trust. (2008). p.45.

Given the abundance of natural resources and habitat connectivity in the Pisgah SEZ, we do not believe this area provides any opportunities for environmentally responsible development. We do however note that there may be lands that are appropriate for development in the adjacent area identified as the Daggett Triangle in **Appendix C**. These lands were identified by environmental stakeholders in 2009 as potentially appropriate for development and should be assessed in conjunction with adjacent private lands, potentially through the DRECP process.

Iron Mountain SEZ

I. Overview

The proposed Iron Mountain SEZ is comprised of 106,522 acres of public land in Ward Valley, a broad valley in the Mojave desert bounded by the Turtle Mountains to the east and the Iron Mountains to the west. The Old Woman Mountains and the Palen-McCoy WAs, with some peaks higher than 5,000 ft (1,524 m), also lie nearby. The area is very isolated and remote and importantly, there is no transmission access within or near this SEZ. **The BLM should remove the proposed Iron Mountain SEZ from further consideration due to the high occurrence of sensitive resources and general inconsistency with criteria the conservation community has developed for siting solar facilities in the desert.** The conservation community expressed this recommendation in scoping comments for the PEIS and the California Energy Commission has previously urged BLM to remove this SEZ as well.

The BLM is currently holding an application for a first in line project in the proposed SEZ, the Ward Valley solar thermal project, that when assessed using the BLM‘s own criteria, is high conflict due to its adjacency to the Turtle Mountains Wilderness. This is exemplary of the types of conflicts that would be seen if this area were approved as a SEZ.

II. Sensitive Natural Resources and Recommended Additional Analysis

i. Overarching issues

Habitat Connectivity

Essential habitat connectivity linkage habitat occurs within the proposed Iron Mountain SEZ, providing habitat for general species occupation and movement across the various habitats in the region. Specifically, it is called the Chocolate Mountains – Turtle Mountains – Ward Valley connectivity area. (Spencer et. al 2010, Appendix B-5, B-52. Natural Landscape Block 72 (Cadiz-Vidal Valleys) falls within the proposed SEZ. (Spencer et. al 2010, Appendix C-4).

The Turtle, Old Woman and Granite Mountains all of which are adjacent to or very near to the proposed Iron Mountain SEZ, support and sustain Desert Bighorn populations. The Iron Mountains are considered a focal point for movements of this species to and from these permanent herd areas. The California Department of Fish and Game has recently determined that the Iron Mountains support a population of 25 Desert Bighorn Sheep, further reinforcing the interconnectivity of these mountain ranges for this species.

This area also provides important connectivity and biological linkage in the ecotone between the Mojave and Colorado Deserts which is important for the desert tortoise, bighorn sheep and other wide-ranging species.

Wildlife and Flora

The proposed SEZ is also located within a BLM-designated multi-species wildlife habitat management area (Northern and Eastern Colorado Desert amendments to the CDCA Plan, 2002, Map 2-21). Desert tortoise, Mojave fringe toed lizard, desert rosey boa, and desert night lizard are all present within the proposed SEZ. The western edge of the proposed SEZ overlaps with known range of bighorn sheep. In addition, there is a very good occurrence of the dune interior verbena – a Fish and Wildlife Service special status and BLM special management plant species.

Golden eagle: The DRAFT PEIS accurately predicts the existence of golden eagle in the proposed Iron Mountain SEZ. As mentioned in the introduction to these comments, the golden eagle is a fully protected species under The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). BLM should require solar developers to follow USFW Interim Golden Eagle Technical Guidance Protocols of March 25, 2010 in determining the presence of Golden Eagle on a project site and within a 10 miles radius outside of a project site in consultation with USFW Service and CDFG.

Water

As with the other SEZs designated in California, the Iron Mountain SEZ has very limited water resources available. The DRAFT PEIS fails to adequately address impacts to a significant drainage in the proposed SEZ which functions as an ephemeral stream. The Environmental Protection Agency recently documented the importance of ephemeral streams in the desert southwest. [30]

Wilderness

The Iron Mountain SEZ includes 10,007 acres of Citizens Proposed Wilderness (see **Appendix B**). Development in these proposed wilderness areas is inappropriate and would preclude opportunities to connect Joshua Tree National Park with the Mojave Preserve.

Historical and Cultural Resources

The Iron Mountain SEZ has been identified by Native American tribes as having great cultural significance. In addition, there is a possible conflict with Patton‘s Iron Mountain Divisional Camp ACEC. The richness of cultural resources known and expected to be in this area render it unsuitable for development.

ii. Recommended boundary adjustments

[30] Levick, L., J. Fonseca, D. Goodrich, M. Hernandez, D. Semmens, J. Stromberg, R. Leidy, M. Scianni, D. P. Guertin, M. Tluczek, and W. Kepner. 2008. The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest. U.S. Environmental Protection Agency and USDA/ARS Southwest Watershed Research Center, EPA/600/R-08/134, ARS/233046, 116 pp.

We recommend eliminating this SEZ due to the high occurrence of sensitive resources and general inconsistency with criteria the conservation community has developed for siting solar facilities in the desert. The conservation community expressed this recommendation in scoping comments for the PEIS and the California Energy Commission has previously urged BLM to remove this SEZ as well. This clearly inappropriate zone should not have been carried forward into the draft PEIS.

iii. Issues requiring special attention at project-level review

The natural resource conflicts and remote and undistributed nature that make the Iron Mountain SEZ unsuitable for development cannot be sufficiently addressed at the project level and our recommendation is that the zone be removed from consideration and that no project applications should be allowed to be filed in this area.

VII. Potential Additional Solar Energy Zones

In 2009 and 2010, conservation stakeholders in California identified lands potentially appropriate for solar development in the California desert and provided maps of these areas to the Bureau of Land Management. These areas are more suitable for solar development, and have lower resource conflicts, than the Iron Mountain and Pisgah SEZs proposed in the PEIS.

One of these areas, the Chocolate Mountains, is currently being evaluated by BLM as a potential Renewable Energy Zone or REZ, which would include solar development. A second, important area to analyze that is not currently being evaluated by the BLM through any ongoing process, including the PEIS, is the West Mojave. The solar industry and elected officials from California have also indicated great interest in seeing a BLM analysis of appropriate lands in the West Mojave, and the BLM should establish a process for reviewing areas not analyzed in the PEIS that may be appropriate for solar development.[31] And as mentioned previously, lands adjacent to the proposed Pisgah SEZ known as the Daggett Triangle should also be analyzed for potential suitability as a development area. Maps showing lands recommended for analysis are provided as **Appendices C and D.**

VIII. Best management practices

Prohibit the use of wet-cooled or other water-intensive technologies: Water is a major concern in the desert regions of California where the proposed SEZs are located, and we urge the BLM to take a proactive approach to this issue in the PEIS. Electric generation from solar (and other) thermal power plants is most efficient when a source of cooling – typically water – is available to remove waste heat from the thermal cycle.

[31] Despite general agreement about the solar opportunities within the West Mojave area, the PEIS identified very few BLM lands in the West Mojave as potentially available for solar development right of way applications. We recommend the BLM broaden the scope of its review within the West Mojave for suitability for solar development beyond those lands identified in the PEIS as part of the process for evaluating a new West Mojave solar zone. As indicated by the attached map (Appendix C), we believe there are more acres available for possible development in the West Mojave than indicated in the PEIS.

Unfortunately, the SEZs that are the focus of the PEIS are located in arid areas where intense competition already exists between the use of limited supplies of water for urban areas, fossil fuel production and agriculture. Permitting water-cooled production of energy from solar resources would add to that competition. The BLM should explore ways to avoid these results in the PEIS, including the options identified below:

Adopt a policy which would prohibit the use of wet-cooling for power plants. The California Energy Commission (CEC) —will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be ‗environmentally undesirable' or ‗economically unsound'."[32] The BLM should adopt a policy that is more robust than the CEC and does not permit use of freshwater based on economic rationales.

Thank you for your thorough consideration of these comments.

Sincerely,

Helen O'Shea, Deputy Director, Western Renewable Energy Project
Natural Resources Defense Council
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Dan Taylor, Director of Public Policy
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Jeff Aardahl, California Representative
Defenders of Wildlife

[32] California Energy Commission, Preliminary Staff Assessment, Beacon Solar Energy Project, Application For Certification (08-AFC-2), Kern County (Posted April 1, 2009) (hereinafter —Beacon Staff Draft"), p. 4.9-5.

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Appendix A. Desert Renewable Energy Conservation Plan Independent Science Advisors Report

Due to the length of The Independent Science Advisors Report we are nor attaching the entire document with these comments. The whole document is available at: http://www.energy.ca.gov/2010publications/DRECP-1000-2010-008/DRECP-1000-2010-008-F.PDF

Appendix B. Citizens Proposed Wilderness and the PEIS in California

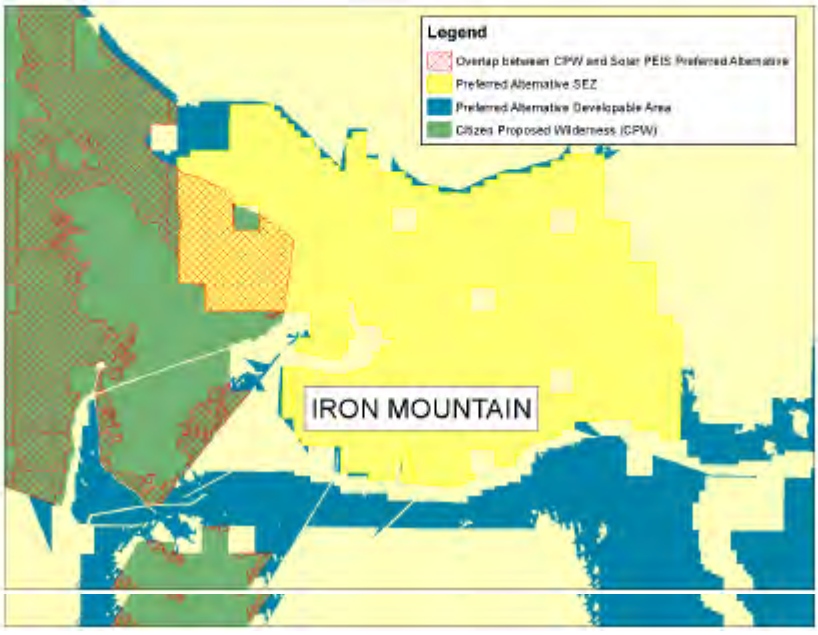
CALIFORNIA

Eight CPW areas were found to overlap the Solar PEIS preferred alternative in California. The CPW information is sourced to the California Wilderness Coalition.

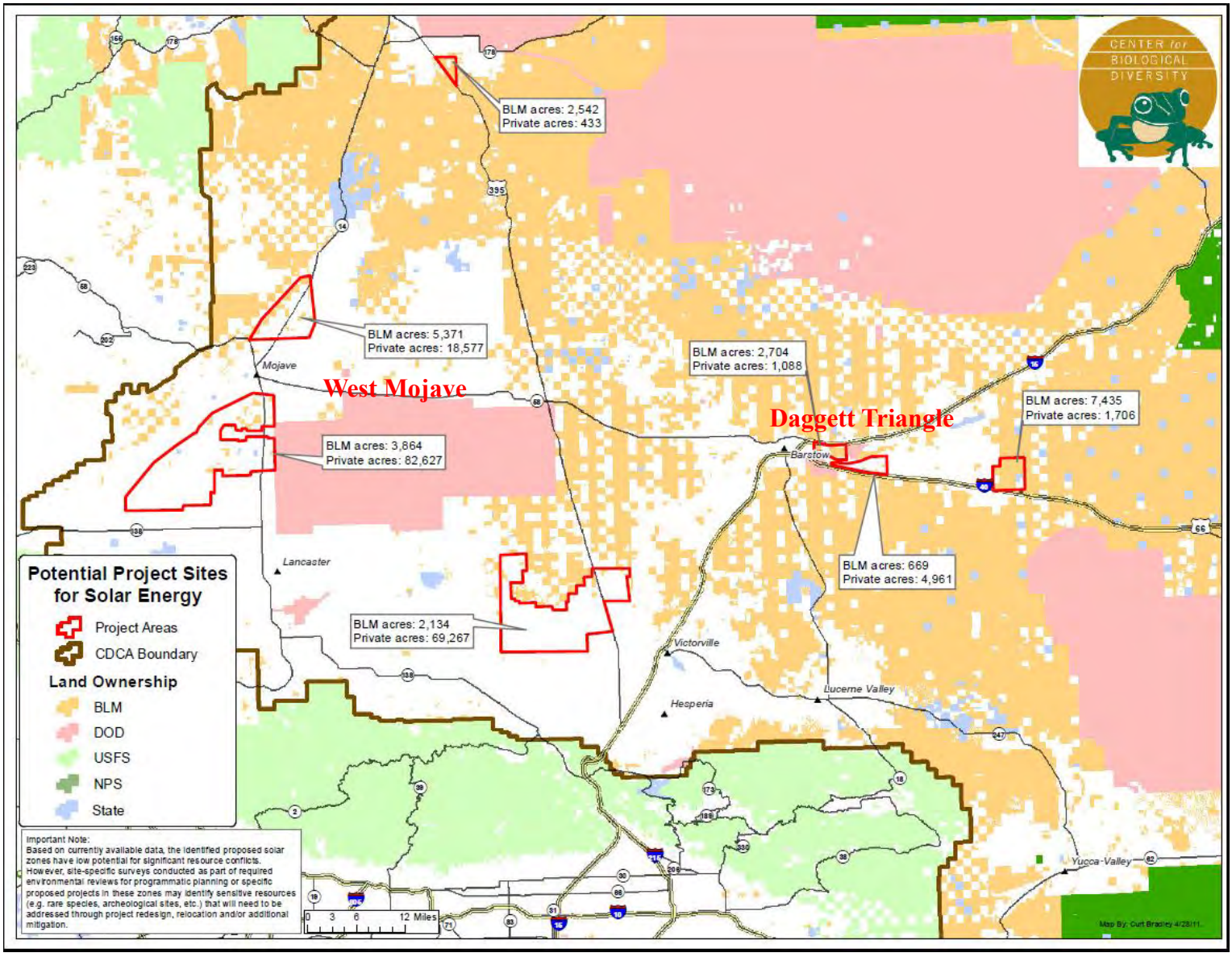
California Citizen Proposed Wilderness Area	Acres of Overlap with Preferred Alternative Developable Area, Not SEZ
Avawatz (BLM - Desert)	9,463.7
Cady Mountains Wilderness Area - Proposed, BLM - Desert	1,164.9
Death Valley National Park Wilderness Area Additions - Proposed, BLM - Desert	1,995.3
Excelsior (Inyo National Forest)	30.1
Iron Mountain (BLM - Desert)	74,003.8
Palen-McCoy Mtns	6,547.4
Volcanic Tablelands (Bureau of Land Management)	77.4
White Mountains (Inyo National Forest)	951.4

SEZ OVERLAP WITH CPW

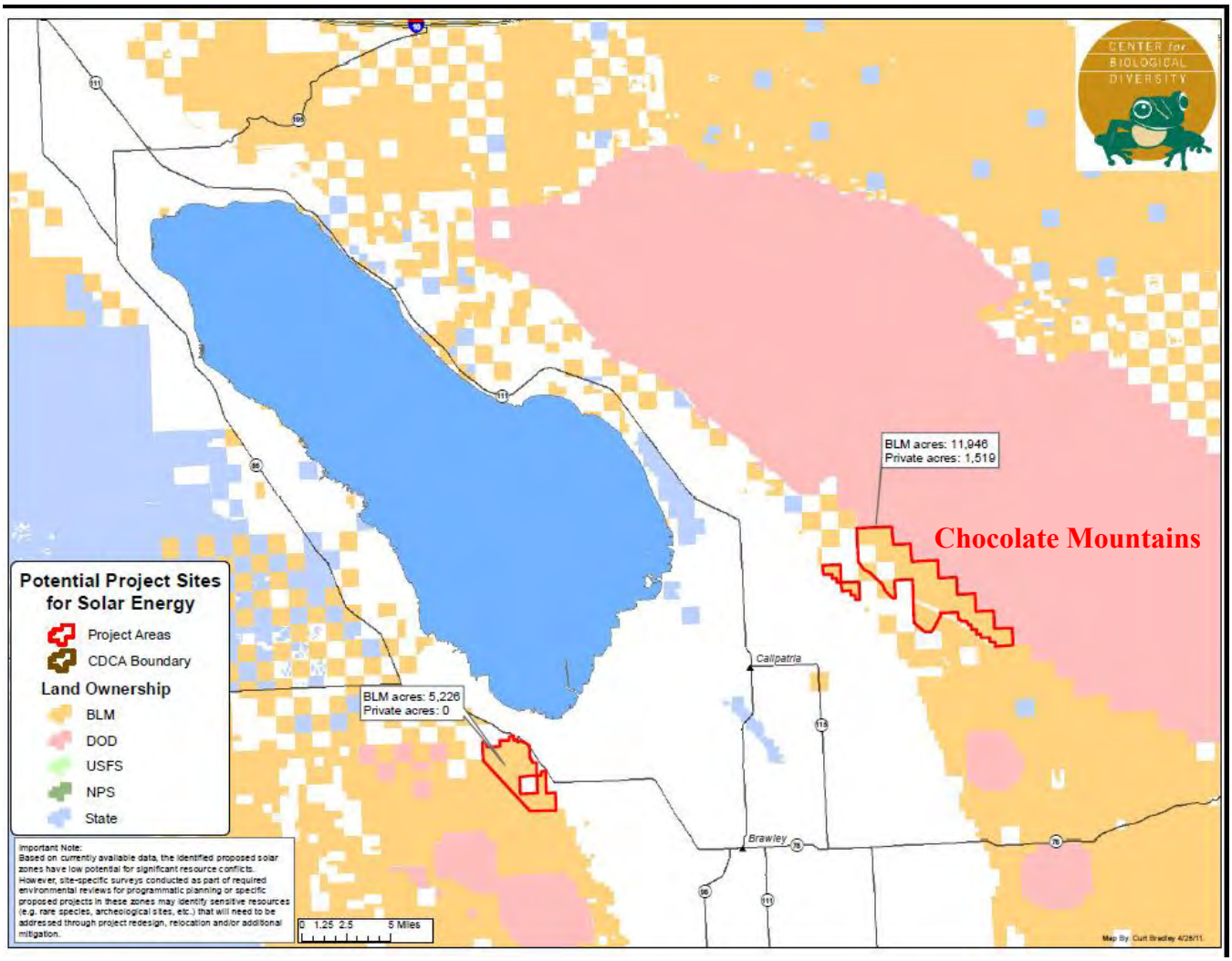
Three of the Solar PEIS SEZs were found to overlap CPW: Pisgah - CA (31 acres of overlap), Iron Mountain – CA (10,007 acres) and Mason Draw – NM (1,810 acres). The wilderness overlap with the Pisgah SEZ is very slight, perhaps a boundary uncertainty. Maps of the Iron Mountain and Mason Draw SEZs are given below.



Appendix C. West Mojave and Daggett Triangle Potential Development Areas



Appendix D. Chocolate Mountains Potential Development Area



Appendix E – Rare Plants, Sensitive Plant Species, and Plant Species of Concern in Each Proposed California SEZ

Alliances – Draft List of Vegetation Types Known or Likely to Occur in the Imperial East SEZ and Environs
California Native Plant Society, February 2011

The alliances and associated listed below include those known to occur within the BLM Soloar Energy Zone (SEZ) and those known to occur within 10 kilometers of the SEZs (and therefore have potential to be present in the SEZ. The list for Imperial East was derived from observation in late 2010; thus, additional information could be acquired for this location.
***** = Considered as Statewide Rare or of High Priority for Inventory (with State Rarity ranking of S3 or below). Also, see the DFG natural communities list, which addresses high ranking of vegetation types.

Imperial East SEZ

Tree Dominated:

Prosopis glandulosa* Shrubland Alliance

*Prosopis glandulosa / Pluchea sericea – Atriplex canescens**

Shrub Dominated:

***Ambrosia dumosa* Shrubland Alliance**

Ambrosia dumosa – Ericameria linearifolia (provisional type based on observation)

***Larrea tridentata* Shrubland Alliance**

Larrea tridentata

Larrea tridentata – Ericameria linearifolia (provisional type based on observation)

***Larrea tridentata-Ambrosia dumosa* Shrubland Alliance**

Larrea tridentata – Ambrosia dumosa

Larrea tridentata-Ambrosia dumosa-Ephedra (*californica*)*

*Larrea tridentata – Ambrosia dumosa / Pleuraphis rigida**

Pluchea sericea* Shrubland Alliance

Alliances – Draft List of Vegetation Types Known or Likely to Occur in the Pisgah SEZ and Environs
CNPS, February 2011

This list was derived from data included in the Mojave Desert Ecosystem Program (see the report by Thomas et al. 2004 and associated MDEP GIS files). The alliances listed below include those known to occur within this BLM Solar Energy Zone (SEZ) and those known to occur within 10 kilometers of the SEZ (and therefore have potential to be present in the SEZ).
***** = Considered as Statewide Rare or of High Priority for Inventory (with State Rarity ranking of S3 or below). Also, see the DFG natural communities list, which addresses high ranking of vegetation types.

Tree Dominated:

Chilopsis linearis* Woodland Alliance

Prosopis glandulosa* Woodland Alliance

Shrub Dominated:

Allenrolfea occidentalis* Shrubland Alliance

***Ambrosia dumosa* Shrubland Alliance**

**Some associations may be rare in area*

***Atriplex canescens* Shrubland Alliance**

***Atriplex polycarpa* Shrubland Alliance**

***Atriplex spinifera* Shrubland Alliance ***

***Bebbia juncea* Provisional Shrubland Alliance**

***Castela emoryi* Shrubland Special Stands**

***Coleogyne ramosissima* Shrubland Alliance**

***Ephedra nevadensis* Shrubland Alliance**

***Larrea tridentata* Shrubland Alliance**

***Larrea tridentata – Ambrosia dumosa* Shrubland Alliance**

***Larrea tridentata – Encelia farinosa* Shrubland Alliance**

***Hymenoclea salsola* shrubland Alliance**

Suaeda moquinii* Shrubland Alliance

***Yucca schidigera* Shrubland Alliance**

Herbaceous:

***Pleuraphis rigida* Herbaceous Alliance ***

Dicoria canescens – Abronia villosa* Herbaceous Alliance

(Likely type in areas mapped as Dunes)

Alliances – Draft List of Vegetation Types Known or Likely to Occur in the Iron Mountain SEZ and Environs
CNPS, February 2011

This list for Iron Mountain region was derived largely from data collected in preparation of the Northern & Eastern Colorado Desert Coordinated Management Plan (see NECO classification report by Evens and Hartman 2007). The alliances and associated listed below include those known to occur within the BLM Soloar Energy Zone (SEZ) and those known to occur within 10 kilometers of the SEZs (and therefore have potential to be present in the SEZ).
* = Considered as Statewide Rare or of High Priority for Inventory (with State Rarity ranking of S3 or below). Also, see the DFG natural communities list, which addresses high ranking of vegetation types.

Tree Dominated:

Parkinsonia florida – Olneya tesota* Woodland Alliance

*Parkinsonia florida – Psorothamnus spinosus / Hymenoclea salsola**

***Psorothamnus spinosus* Woodland Alliance**

Psorothamnus spinosus / Ephedra (californica) – Hymenoclea salsola

***Tamarix* spp. Woodland Semi-Natural Stands**

(may include plantings)

Shrub Dominated:

***Ambrosia dumosa* Shrubland Alliance**

Ambrosia dumosa – Ephedra (californica) sandy*

Ambrosia dumosa / Brassica tournefortii

***Ephedra californica* Shrubland Alliance**

*Ephedra (californica) – Psorothamnus emoryi/Pleuraphis rigida**

***Larrea tridentata-Ambrosia dumosa* Shrubland Alliance**

Larrea tridentata – Ambrosia dumosa – Krameria grayi

*Larrea tridentata – Ambrosia dumosa / Pleuraphis rigida**

Larrea tridentata – Ambrosia dumosa – Atriplex polycarpa

Larrea tridentata – Ambrosia dumosa/Brassica tournefortii

Suaeda moquinii* Shrubland Alliance

*Suaeda moquinii – Atriplex canescens – Atriplex polycarpa**

*Suaeda moquinii/sparse playa**

Herbaceous Dominated:

***Brassica (tournefortii)* Herbaceous Semi-Natural Stands**

Pleuraphis rigida* Herbaceous Alliance

*Pleuraphis rigida / Ambrosia dumosa**

Alliances & Associations – Draft List of Known or Likely to Occur Vegetation Types in the East Riverside SEZ and Environs

CNPS, February 2011

This list was derived largely from data collected in preparation of the Northern & Eastern Colorado Desert Coordinated Management Plan (see NECO classification report by Evens and Hartman 2007), and from additional data collected in 2011 during a CNPS vegetation mapping workshop at Palen Lake. Because the vegetation communities throughout the entire East Riverside Solar Energy Zone (SEZ) are not yet mapped, the alliances and associated listed below include those known to occur within the SEZ and those that occur within 10 kilometers of the SEZ (and therefore have potential to be present in the SEZ).

* = Considered as Statewide Rare or of High Priority for Inventory (with State Rarity ranking of S3 or below). Also, see the DFG natural communities list, which addresses high ranking of vegetation types.

Tree Dominated Types:

Parkinsonia florida – Olneya tesota* Woodland Alliance

*Parkinsonia florida / Larrea tridentata – Peucephyllum schottii**

*Parkinsonia florida - Olneya tesota**

Parkinsonia florida / (*Psorothamnus emoryi, Pleuraphis rigida*) (provisional dune type)*
Parkinsonia florida - *Olneya tesota / Hyptis emoryi**
*Parkinsonia florida**
*Parkinsonia florida / Hyptis emoryi**
*Olneya tesota**
*Olneya tesota / Psorothamnus schottii**

Prosopis glandulosa **Woodland Alliance***
Prosopis glandulosa – Atriplex spp.*

Psorothamnus spinosus **Woodland Alliance***
Psorothamnus spinosus / Ephedra (*californica*) - *Ambrosia salsola*

Shrub Dominated Types:

Allenrolfea occidentalis **Shrubland Alliance***
*Allenrolfea occidentalis**
Allenrolfea occidentalis - *Suaeda moquinii**

Ambrosia dumosa **Shrubland Alliance**
*Ambrosia dumosa – Ephedra californica**
*Ambrosia dumosa / Pleuraphis rigida**

Atriplex canescens **Shrubland Alliance**
Atriplex canescens

Atriplex polycarpa **Shrubland Alliance**
Atriplex polycarpa Sparse Playa

Atriplex spinifera **Shrubland Alliance ***
*Atriplex spinifera**

Encelia farinosa **Shrubland Alliance**
Encelia farinosa

Larrea tridentata **Shrubland Alliance**
Larrea tridentata
Larrea tridentata – Atriplex polycarpa
Larrea tridentata / Cryptogamic crust
*Larrea tridentata / Pleuraphis rigida**

Larrea tridentata – Ambrosia dumosa **Shrubland Alliance**
Larrea tridentata – Ambrosia dumosa
Larrea tridentata – Ambrosia dumosa – Krameria grayi
*Larrea tridentata – Ambrosia dumosa – Fouquieria splendens**
*Larrea tridentata – Ambrosia dumosa – Olneya tesota**

*Larrea tridentata – Ambrosia dumosa – Psorothamnus spinosus**

Larrea tridentata – Ambrosia dumosa / Cryptogramic crust

Larrea tridentata – Encelia farinosa Shrubland Alliance

Larrea tridentata – Encelia farinosa

Larrea tridentata – Encelia farinosa – Ambrosia dumosa

Pluchea sericea Shrubland Alliance*

*Pluchea sericea**

Suaeda moquinii Shrubland Alliance*

*Suaeda moquinii**

*Suaeda moquinii – Atriplex canescens**

Herbaceous Types:

***Brassica* (*tournefortii*) Herbaceous Semi-Natural Stands**

Brassica tournefortii / Ambrosia dumosa

***Pleuraphis rigida* Herbaceous Alliance ***

*Pleuraphis rigida** *(in desert washes and on dunes)*

*Pleuraphis rigida / Ephedra (californica)**

Dicoria canescens – Abronia villosa* Herbaceous Alliance

*Dicoria canescens**

*Salsola tragus - Oenothera deltoides** *(provisional dune type based on observation)*

Petalonyx thurberi* Provisional Herbaceous Stands

(provisional sandy type based on observation in area and recent data collection on NPS lands)

Wislizenia refracta Herbaceous Special Stands*

Miscellaneous Land Use Types:

Simmondsia chinensis plantations and other agricultural field

Appendix F. Sand Transport Studies

Due to the length of the following three sand transport studies, the documents have been provided to the BLM on CD-ROM:

Barrows, C.W., M.F. Allen, J.T. Rotenberry 2006. Boundary processes between a desert sand dune community and an encroaching suburban landscape. Biological Conservation 131: 486-494.

ESA/PWA 2011. Geomorphic Assessment and Sand Transport Impacts Analysis of the Colorado River Sub Station. Prepared for California Public Utilities Commission and Aspen Environmental. Revised February 2, 2011. Pgs. 49

Muhs, D.R., R.L. Reynolds, J. Been and G. Skipp 2003. Eolian sand transport pathways in the southwestern United States: importance of the Colorado River and local sources. Quarternary International 104: 3-18.

Thank you for your comment, Roy Skinner.

The comment tracking number that has been assigned to your comment is SolarD11787.

Comment Date: April 29, 2011 17:37:28PM
Solar Energy Development PEIS
Comment ID: SolarD11787

First Name: Roy
Middle Initial:
Last Name: Skinner
Organization: First Solar, Inc.
Address: 353 Sacramento Street
Address 2: Suite 2100
Address 3:
City: San Francisco
State: CA
Zip: 94111
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: First_Solar_Comments_on_Solar_PEIS.pdf

Comment Submitted:

First Solar's comments on the Draft Programmatic Environmental Impact Statement for Solar Energy Development in the Six Southwestern States are attached.

First Solar

April 29, 2011
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue, EVS/900
Argonne, IL 60439

Re: First Solar Comments on the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

To whom it may concern:

First Solar appreciates the opportunity to provide comments on the Draft Programmatic Environmental Impact Statement (PEIS).

As the world's leading manufacturer of thin-film solar photovoltaic modules and the nation's leading independent developer of utility scale solar generating assets, First Solar has completed site design and permitting for major projects in a broad spectrum of jurisdictions, including over 300 MW of capacity located on lands managed by the Bureau of Land Management (B LM). In addition First Solar has another 550 MW on BLM land to receive final permits in mid 2011, and up to 600 additional MW in 2012. As a result, First Solar has a direct commercial interest in the matters addressed in the draft PEIS as well as a significant interest in the ongoing development of policies guiding the siting and permitting of future projects on lands within the BLM's jurisdiction.

The federal government has implemented policies and programs to encourage accelerated development of renewable energy toward the objective of achieving reductions in carbon emissions and advancing energy independence. These include the federal loan guarantee program authorized under the Energy Policy Act of 2005, and the tax grant and investment tax credit program implemented under the American Recovery and Reinvestment Act of 2009. Development of utility scale solar projects on federal lands is essential to realizing these objectives. BLM and DOE policies for development of solar energy on federal lands must be consistent with the overall federal objectives by facilitating responsible solar development.

As stated in the draft PEIS, the BLM's Solar Energy Program is intended to achieve the following objectives:

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- Facilitating near-term utility-scale solar energy development on public lands;
- Minimizing potential negative environmental, social, and economic impacts;
- Providing flexibility to consider a variety of solar energy projects (location, facility size, technology, and so forth);
- Optimizing existing transmission infrastructure and corridors; and
- Standardizing and streamlining the authorization process for utility-scale solar energy development on BLM-administered lands.

In its current form, however, the draft PEIS will fail to accomplish these objectives.

First Solar has contributed to, and concurs with, the comments jointly submitted by the Large-scale Solar Association (LSA), the Center for Energy Efficiency and Renewable Technologies (CEERT), and the Solar Energy Industries Association (SEIA). First Solar will not repeat these comments here. However, First Solar would like to emphasize, and further elaborate on, certain concerns addressed by the solar industry groups. In particular, First Solar would like to (1) express concern with the proposed exclusion of solar development from large areas of federal land throughout the southwest, and (2) stress the importance of BLM continuing to process existing right-of-way (ROW) applications, without regard to the timing or the final form of the PEIS.

Designating Broad Areas for Exclusion of Solar Development Unnecessarily Precludes Development within Optimal Solar Resource Areas

Sensitive and valuable natural resources should be protected. What the PEIS fails to recognize is that limited solar development is compatible with many of these resources, provided the projects incorporate proper design and mitigation that minimizes impacts to the resource.

An example of the ability to design solar projects that are compatible with other uses is First Solar's Silver State project in southern Nevada. The project is located within a Special Recreational Management Area (SMRA). The draft PEIS would preclude all development in SMRAs. However, the Silver State project is designed to coexist with the recreational uses. First Solar took the initiative to meet with recreational users in the area, and based on these discussions along with consultation with the local BLM office, designed the facilities to accommodate existing and future recreational requirements. By making these accommodations, the solar project and recreational uses are able to coexist without significantly impacting the uses designated by the SMRA.

Proposed development in sensitive resource areas should be evaluated on a case-by-case basis. The exclusion criteria identified in the PEIS should be used as a tool in siting solar projects, but not used as an absolute prohibition to development. In this way, the full potential for solar development can be realized, while protecting critical resources.

Existing ROW Applications are Critical to both the Near-Term and Long-Term success of Utility Scale Solar Development in the U.S.

Although the Preferred Alternative (Solar Energy Development Program Alternative), as proposed in the draft PEIS, would result in BLM continuing to process existing applications, numerous comments received at the PEIS public meetings focused on promoting the SEZ only alternative (Solar Energy Zone Program Alternative), an approach that would potentially result in precluding or delaying the development of a number of existing projects, currently well along in their permitting process. This would likely have a significant impact on the near-term development of solar power on federal lands, and, by definition, would be contrary to the stated objectives of the BLM's Solar Energy Program.

Many of the most advanced solar projects on BLM land are sited outside of the SEZs identified in the draft PEIS. For example, almost all of the utility scale solar projects currently in development on federal lands in Nevada are outside the SEZs proposed for Nevada in the draft PEIS. The attached figure shows the location of existing BLM ROW applications in Nevada in relationship to the SEZs identified in the draft PEIS.

Many of the existing ROW applications within the six western states covered by the PEIS are far along in the environmental review and permitting process. Some of these projects have power purchase agreements and priority positions in the transmission interconnection queue (e.g., First Solar's Stateline and Silver State projects). These projects are the most viable solar projects on BLM land in the near-term given their commercial viability and advanced state of development, and are necessary to maintain the utility scale solar industry's forward momentum.

Without timely review, many of the most viable projects would suffer significant financial impact, and ultimately could fail. Development of utility scale solar projects is a multi-year process. Delaying or denying these ROW applications because they are located outside SEZs would effectively set solar development back several years.

We ask that these advanced projects, including First Solar's Stateline and Silver State projects, be allowed to proceed on a priority basis, regardless of which PEIS alternative is selected by the BLM. BLM's staff resources should be focused on processing these existing applications to ensure that the advanced solar projects on federal land reach the market at the earliest possible time. Processing of new applications within proposed SEZs should not be at the expense of existing applications.

Many Existing ROW Applications are Strategically Located to Take Advantage of Existing Transmission Capacity

The viability of any utility scale project ultimately depends on the availability of a suitably located transmission interconnection of sufficient capacity to accommodate the full output of the proposed solar project. Utilities are not obligated to build generation tie-lines to connect solar projects to the utility transmission grid, and construction of lengthy generation tie-lines by the solar developer is prohibitive, both from a standpoint of cost and right of way acquisition.

As demonstrated in the solar industry comments on the PEIS, most of the SEZs proposed in the draft PEIS are located in areas that do not have access to the existing utility transmission grid, and therefore would be dependent on the planning, permitting and construction of new transmission facilities either to reinforce and expand the utility grid or to build long generation tie-lines, a process which typically takes anywhere from 7 to 10 years. The existing utility transmission system only has a few feasible near-term interconnection locations for solar projects, and many of the existing applications for BLM solar ROWs, including Silver State and State Line, are located at these locations. Therefore, achieving the government's stated goals of "facilitating near-term solar development" and "optimizing existing transmission infrastructure" necessitates an emphasis on developing solar projects at these locations. At the very least, it is critical that the PEIS not adopt policies that halt or slow-down development of advanced projects at locations with near term transmission availability.

Summary of Recommendation

1. The PEIS should be revised with consideration of the comments provided here and in the solar industry comments, and should be applied prospectively.
2. Areas designated in the PEIS for exclusion of solar development should instead be used to guide future solar development, and not categorically exclude development from all of these areas.

3. BLM should continue to process existing advanced ROW applications for solar development under existing procedures and guidelines, regardless of their location with respect to the proposed SEZs.

Thank you for considering First Solar's comments and recommendations on the draft PEIS. We believe that with the revisions proposed in the solar industries comment letter, as well as those we have outlined here, BLM can meet its Solar Energy Program objectives for solar development in the Southwest.

Sincerely,

Roy Skinner
Director, Siting and Permitting

First Solar

Location of ROW Applications in Nevada Compared to Proposed SEZs

Thank you for your comment, Katherine Michalak.

The comment tracking number that has been assigned to your comment is SolarD11788.

Comment Date: April 29, 2011 20:34:50PM
Solar Energy Development PEIS
Comment ID: SolarD11788

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Attachment: Comments, Katherine Michalak, Solar PEIS.doc

Comment Submitted:

Please see attachment.

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April 29, 2011

Regarding the Bureau of Land Management's Solar-on-public-lands PEIS:

Often, when it comes to controversial land use, environmentalists take an extreme position and are therefore written off to some extent. I happen to have strong reservations about the implementation of large scale centralized solar projects, but I would like to voice these concerns from an economic rather than strictly environmental perspective.

When any large project is undertaken, it makes sense to proceed in such a way as to make the most use possible of all available resources. Skyscrapers are built in order to make the most use of the limited land within a city, and subways to make double use out of transportation lines. When we look at the facts of the current issue, we see that over the next 50 years we'll need sustainable energy, most likely ever-increasing residential and commercial infrastructures, and also enough unspoiled natural areas so as to retain quality of life and tourism appeal. It makes sense to stretch our resources as far as possible, and this means double-using our developed areas for distributed PV solar whenever possible. This way, we'll retain more land which can be used for conscientious development over time if our population increases, and the quality of life in these new, as well as our existing developments, will not be compromised by industrial solar.

I realize that there are many financial challenges to distributed solar, but even so, the distributive approach is worth researching thoroughly with a goal to making it work if it all possible, because once we use up our resources—untouched lands—we can never regain them.

One of the challenges I see in abandoning the centralized approach is that this means also abandoning the corporations who are prepared to invest in making solar ideas a reality. However, these corporations have a history of behaving irresponsibly, and the easy way now may lead to major environmental and financial problems in the end.

I urge the BLM to consider carefully how to use their power within the government as a whole in regards to solar implementation.

Sincerely,

Katherine Michalak

Thank you for your comment, Greg Seymour.

The comment tracking number that has been assigned to your comment is SolarD11789.

Comment Date: April 30, 2011 09:51:00AM
Solar Energy Development PEIS
Comment ID: SolarD11789

First Name: Greg
Middle Initial:
Last Name: Seymour
Organization:
Address:
Address 2:
Address 3:
City:
State:
Zip:
Country:
Privacy Preference: Don't withhold name or address from public record
Attachment: NWP Nevada DPEIS Comments.pdf

Comment Submitted:

Please see attached

April 29, 2011

Delivered via electronic submission to the BLM Solar PEIS website (http://solareis.anl.gov) and in hard copy format via U.S. mail.

Linda Resseguie, BLM Solar PEIS Project Lead
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue - EVS/240
Argonne, IL 60439

Re: Comments on Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States—Nevada only

Dear Ms. Resseguie:

Please accept these comments on the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (DPEIS) on behalf of The Nevada Wilderness Project and Nevada Conservation League. We appreciate the opportunity to comment. Both organizations have worked proactively and pragmatically to address solar development on public lands in Nevada and to support a transition to renewable energy with Nevada in the lead.

Of the more than 21 million acres in the preferred alternative, over 9 million, or 42 percent of the total, are in Nevada. This, along with increasing demand for renewable energy, places Nevada's public lands at ground zero for utility scale solar development. Nevada is ranked 11th in biological diversity of all states, has over 314 named mountain ranges, and has 52 designated wilderness areas and 62 wilderness study areas on BLM lands. To say that there are unique and important species, habitats and landscapes that can be affected by solar development within the preferred alternative in the DPEIS would be an understatement.

Additionally, our organizations were hopeful that the PEIS would develop an approach to concentrate development activities to zones in order to: 1) simplify process and workload on the BLM; 2) eliminate the current piecemeal approach and overhead of project-by-project reviews for state and federal agencies, conservation groups and other interested parties; and 3) to produce clear direction for industry on where solar development can proceed.

Because of these tremendously important resource concerns, we are asking that you fully consider a separate approach than any of the DPEIS alternatives and designate consensus solar energy zones with immediate identification of additional zones in an ongoing process to meet demand for utility scale solar energy development. Additional zone development would involve all stakeholders including, but not limited to, local interests, state and federal agencies, tribes, industry and conservation groups.

Thank you for your thorough consideration of our comments. Please contact either of us if you have any additional questions or would like to review detailed maps that can clarify sensitive wildlife concerns purposefully omitted from these public documents.

Sincerely,

Greg Seymour
Renewable Energy Program Coordinator
Nevada Wilderness Project
P.O. Box 571675
Las Vegas, Nevada 89157

and

Scot Rutledge
Executive Director
Nevada Conservation League & Education Fund
817 South Main Street
Las Vegas, NV 89101

Table of Contents

I. Introduction

Our nation's growing addiction to fossil fuels, coupled with the unprecedented threats brought about by climate change, imperils the integrity of our wildlands and wildlife as never before. To sustain our wildlands, wildlife, and our human communities, the undersigned believe the nation must transition away from fossil fuels and toward a clean energy future as quickly as possible. To do this, we must eliminate energy waste; moderate demand through energy efficiency, conservation, and demand-side management practices; and rapidly develop and deploy clean, renewable energy technologies, including at the utility-scale. Renewable energy development is not appropriate everywhere on the public lands, however, and it is imperative for our future and the future of our wildlands and wildlife that we strike a balance between addressing the near-term impact of utility-scale solar development with the long-term impacts of climate change on our biological diversity, fish and wildlife habitat, and natural landscapes. To ensure that the proper balance is achieved, we need smart planning for renewable power that avoids and minimizes adverse impacts on wildlife and wild lands. These projects should be placed in areas

of low conflict, including already disturbed lands, and near existing transmission lines and other supporting infrastructure.

We strongly believe that the long-term, environmentally responsible success of the Bureau of Land Management's (BLM) solar energy program depends on developing policy and guidelines that guide projects to the most suitable locations, thus limiting environmental impacts and reducing obstacles to construction of the most appropriate projects. The DPEIS offers just such an opportunity, and we look forward to working with the BLM to ensure that the agency: 1) identifies and designates suitable Solar Energy Zones; 2) guides solar projects to those zones; 3) develops a process for identifying and designating new zones, as appropriate; and 4) develops additional policy needed to support an environmentally responsible solar energy development program on our public lands.

These comments are focused on the elements of the DPEIS that address or will influence solar development in Nevada, including broad policy issues.

II. Alternatives

A. The BLM should select as its preferred alternative a modified Solar Energy Zones (SEZ) Alternative

The SEZ Alternative would designate seven Solar Energy Zones in Nevada. The DPEIS defines a Solar Energy Zone (SEZ) as "an area with few impediments to utility-scale production of solar energy where BLM would prioritize solar energy and associated transmission infrastructure development." DPEIS, p. 2-10. The SEZs were identified based on solar resources, existing transmission and infrastructure, minimum size, lack of slope, screening out units of the National Landscape Conservation System and other classes of lands with high sensitivity and/or conservation values, and taking into account local conditions, institutional knowledge, and other ongoing coordination efforts. DPEIS, p. 2-10.

With appropriate modifications, a modified SEZ Alternative offers the best way to develop a successful and environmentally responsible solar program for our public lands. One important modification regards the removal of problematic SEZs and the refinement of others. Not all of the currently identified SEZs are appropriate for development, and it is important that the BLM continue to refine the SEZ selection through the PEIS process – the comments included in section V are intended to help the BLM refine the SEZs in Nevada and identify and complete additional analysis that will enable efficient and environmentally responsible permitting of projects once the PEIS is finalized. By focusing on the places with the best chances for successful projects, a modified Solar Energy Zones Alternative will lead to solar development that is faster, cheaper and better for the environment, consumers and project developers.

Beyond the benefits of focusing on the places with the best chances for successful solar development, it is important to note that the modified SEZ Alternative is an excellent starting point for the BLM's solar program. The SEZs currently under consideration in the DPEIS include more than three times as much land as the BLM forecasts will be developed during the 20-year life of the PEIS. Though the acreage of the SEZs should change through refinements in

the PEIS process, a modified SEZ Alternative offers plenty of flexibility to build a foundation for solar development on public lands. Another important modification to the SEZ Alternative is the creation of a robust and efficient process to designate new SEZs in the future. With our recommendation that the BLM create a process for designating new SEZs going forward, the BLM can easily use this starting point to build a roadmap to our clean energy future.

B. The BLM should not adopt the Solar Energy Development Program (SEDP) Alternative

While a modified SEZ Alternative offers great promise for building a successful, environmentally responsible solar program, the SEDP Alternative risks facing the same problems which have plagued the BLM's oil and gas program – projects spread scattershot across the West, damage to wildlife and wildlands, and costly conflicts, delays and litigation. We are extremely concerned that the BLM has chosen the SEDP Alternative as its Preferred Alternative, and we urge the BLM to select a modified SEZ Alternative as the Preferred Alternative instead.

The SEDP Alternative would jeopardize both our clean energy future and our western wildlands. The BLM should not carry forward a plan that opens approximately 22 million acres to energy development – this is over 100 times more land than what the agency's own analysis says is really needed, and includes many places that should be protected for wildlife habitat and clean air and water. Section IV includes details on some of the places in Nevada's 9.1 million acres that are particularly inappropriate and problematic and yet would be open for solar development under the SEDP Alternative.

This outdated and inefficient approach could impede the BLM's solar program just as it begins to take off. Opening such huge and potentially inappropriate areas for development without meaningful incentives to locate projects in zones undermines the carefully chosen low conflict/high resource SEZs, and will ultimately inhibit the development of the fledgling solar energy industry, causing major setbacks to our desperately needed transition to a clean energy economy.

For these reasons, the BLM should choose a modified SEZ Alternative as the Preferred Alternative. By focusing on areas where projects have the greatest chance for success, rather than wasting time and resources "fixing" bad proposals, the BLM can ensure that good projects move forward and our most sensitive wildlands and wildlife habitat are protected.

C. As part of a modified SEZ alternative, the BLM should develop a process for identifying and designating new SEZs, as appropriate

As noted above, the SEZs as currently drawn include more than three times as much land as the BLM forecasts will be developed during the 20-year life of the PEIS and, even with expected refinements, can provide a solid foundation on which to build the BLM's solar program.

We expect that there are also other lands outside of the current SEZs that may be appropriate for SEZ designation and subsequent project development. To ensure that the BLM's solar program continues to grow in an environmentally responsible way, the agency should create a process for

designating new SEZs as appropriate in the future. This will be particularly important for some states, such as Arizona, that currently have relatively few acres identified as SEZs. By creating a process that prioritizes SEZ designation on lands with excellent solar resources, close to existing roads and transmission lines, and few conflicts with natural and cultural resources, the BLM can carry its guided development model forward as the solar program continues to grow.

Development of a robust and efficient process to designate new SEZs will provide the benefits of continuing to identify and prioritize appropriate areas for development while avoiding the problems and controversy of the SEDP Alternative.

III. Overarching Issues for Solar Development on Public Lands in Nevada

BLM should address the issues below when considering siting or permitting any solar development on public lands in Nevada, whether inside or outside of a SEZ.

A. Water resources

The Southwest is an arid environment, where water is scarce and riparian and aquatic ecosystems are already stressed. The same basins that contain excellent solar resources often have little water to spare for energy development; many are already fully or over-appropriated, and many are in a state of overdraft. One research group has found that water availability highly constrains thermoelectric cooling in many of the same areas proposed for solar energy development. *See* EPRI, A Survey of Water Use and Sustainability in the United States with a Focus on Power Generation (Nov. 2003) (finding high cooling constraints in Clark County, NV; San Bernardino, Riverside, Imperial and San Diego Counties, CA; Doña Ana County, NM; and Alamosa County, CO).

Given the importance of water to human life and healthy ecosystems, it is critical that BLM ensures that solar energy development limits resource conflict and reduces energy production's vulnerability to water shortage by minimizing water use. Intensive water use also is contrary to the public interest in protecting sensitive landscapes, imperiled species and precious waters. We agree that "water use and water availability are key considerations" when selecting solar energy technology, DPEIS 3-13; water availability – both physical and legal – should dictate the choice and approval of solar energy technologies.

For all solar development permitted by BLM, developers must ensure that solar energy water use will not contribute to exceeding the sustainable yield of the surface or groundwater source,[1] to injury to other water rights holders, to injury to federal trust resources, or to adverse effects on special status species. We support the proposed design features required of all solar energy development approved by BLM that prohibit water use that exceeds sustainable yield or affects special status species and sensitive habitats. *See* DPEIS A-54, A-57. That said, we recommend BLM include a similar prohibition on project water use that affects federal trust resources such

[1] We also suggest a definition for safe or sustainable yield of surface water sources, as one is currently missing from the glossary. "The level of water extraction from a particular system that, if exceeded, would compromise key environmental assets, or ecosystem functions and the productive base of the resource."

as national wildlife refuges, national parks, areas of critical environmental concern and similar public lands.

In fully appropriated, over-appropriated or overdrafted surface or groundwater basins, BLM and the project developer must ensure that solar energy projects result in no net depletions of water resources or that any depletions are offset. In overdrafted basins, they should also reduce the amount of overdraft. Any increase in depletions constitutes a new appropriation on the system that will reduce streamflow and drawdown aquifers, adversely affecting vegetation, wetlands, riparian areas, seeps, springs and other wildlife habitats.

The technology exists to conserve our water resources. In basins with little or no available water, it appears that only dry-cooled or non-cooled technologies may be feasible. Cooling systems such as dry cooling and hybrid cooling can conserve water in the cooling cycle, and PV and dish systems can conserve even more water because no cooling cycle is needed. Should cooling technologies become more water efficient or other technologies that operate without a cooling cycle develop, there may be additional opportunity for solar development in areas with limited water resources. Should non-freshwater sources, such as municipal wastewater, be available, there may be opportunities to utilize water-dependent technologies for cooling or other needs.

BLM has acknowledged in the DPEIS that wet cooling is not feasible within nearly every proposed SEZ. In light of such limited water availability, we expect that the inclusion of design features finding wet cooling infeasible establishes a presumption against BLM approval of projects utilizing wet cooling. Most proposed wet-cooled projects will present both significant resource conflicts in their attempts to obtain adequate water rights and also challenges in avoiding unacceptable impacts to water resources and the ecosystems, habitat and species that depend on them.

For these reasons, we recommend requirements that limit impacts by basing the selection of solar energy technologies and the level of solar development on the available water supply; prohibit unacceptable impacts caused by water use, by, for example, denying an application if the water requirements of the proposed technologies would result in unacceptable impacts; and mitigate adverse impacts to water and ecological resources. BLM may require a project developer to use non-freshwater sources, such as municipal effluent, or acquire rights that offset and mitigate for adverse impacts to spring discharge, water levels, recharge, groundwater-dependent fish and wildlife, or other impacts, potentially achieving a net gain in water available for ecosystem and habitat needs.

i. Cumulative impacts to water resources

The DPEIS fails to conduct a meaningful analysis of the cumulative impacts of solar energy development with its analysis of each SEZ, within flow systems and across the state as a whole. This is particularly true concerning the availability of groundwater for solar projects and the impacts of groundwater withdrawals on special status species and other public trust resources. Withdrawal of over thousands of acre-feet of water from these basins will intercept the source of the water that now maintains the numerous springs, seeps, marshes, streams, and riparian and

mesquite habitats that support the wildlife and plant resources including migratory birds and threatened and endangered species. Many of these habitats are federally protected wildlife refuges, national parks and monuments, and national recreation areas that are supported by federally held water rights.

For example, there is no analysis within each SEZ of the cumulative impacts of water use on fish and wildlife and their habitats. Despite having the data necessary to estimate the cumulative impacts of water use on groundwater-dependent species, BLM claims that the "[i]mpacts of groundwater depletion from solar energy development in the Amargosa Valley SEZ cannot be quantified without identification of the cumulative amount of groundwater withdrawals needed to support development on the SEZ." DPEIS 11.1-194. BLM has estimated low and high water demands for construction and operation within the SEZ (see DPEIS Tables 11.1.9.2-1 and 11.1.9.2-2) and is capable of estimating water demands of nearby projects (see Table 11.1.22.2-2) – BLM simply needs to incorporate this information into a regional groundwater model that could project the impacts of groundwater pumping on species habitats but has failed to do so in the DPEIS. Compare BLM, Amargosa Farm Road Solar Energy Project Final EIS (2010) at Chapter 4.4, Appendix B (utilizing Death Valley Regional Flow System Model to evaluate effects of pumping 400 acre-feet per year (afy) on groundwater dependent species at Devil's Hole and Ash Meadows). Failure to model these impacts renders BLM's conclusion that "[t]he implementation of programmatic design features and complete avoidance or limitations of groundwater withdrawals from the regional groundwater system would reduce impacts on the groundwater-dependent species to small or negligible levels" unsupportable. DPEIS 11.1-194. *See also* DPEIS 11.2-185 (Delamar Valley SEZ); 11.3-178 (Dry Lake SEZ).

It is precisely at the scale of a programmatic EIS that BLM should assess the impacts of the loss of interbasin flow and examine the reasonably foreseeable cumulative impacts of water use for solar energy projects on groundwater-dependent species and their habitats. The BLM should include these analyses in the FPEIS.

The DPEIS also fails to discuss the potential for increased competition for water resources in the area, and the indirect socioeconomic and ecosystem impacts of allocating water to energy production. Such an analysis is particularly important to informing the impacts of allocating nearly all of a basin's unallocated perennial yield to solar energy development, if indeed any perennial yield is unallocated, and of re-allocating existing uses to energy development. The FPEIS should include analysis of these potential impacts.

If water is imported from off-site for projects, the FPEIS should disclose the impacts of increased vehicle traffic and the likely off-site sources and potential impacts to those sites.

B. Water quality

The BLM should include additional analysis and discussion of existing water quality conditions, water treatment, and impacts to water quality in the FPEIS. The DPEIS provides a brief discussion of groundwater quality in the SEZs, but fails to provide any baseline information regarding surface water quality. There is no discussion of the size, type or extent of surface or

groundwater quality impacts due to sedimentation, runoff, contaminant spills, herbicide application or wastewater treatment.

In fact, the DPEIS provides little information that discerns any difference between wastewater treatment alternatives or how an alternative might be chosen. The FPEIS should disclose this information, including the contaminants in the wastewater as well as treatment methods, chemicals that may be stored or used, and the potentially affected acreage if treated on-site and the impacts of the increase in vehicle traffic if treated off-site.

The DPEIS also gives little detail regarding the need for or methods of treating water for potable uses, such as the chemicals to be used, and no information regarding the need to treat water for use in the steam and cooling cycles. This information should all be included in the FPEIS.

C. Impacts to groundwater-dependent species and their habitats

The impacts of groundwater withdrawals on spring, riparian and aquatic species located both near and far, within the Death Valley, White River, Virgin River Valley and Meadow Valley Wash Regional Flow Systems are of grave concern, particularly considering competing demands for the same water. Dominant hydrologic features of the White River and Death Valley flow systems are the large groundwater discharges from numerous carbonate springs scattered throughout the area; e.g., springs in Pahranagat Valley and the Muddy Rivers Springs Area, and the Ash Meadows area, respectively. Groundwater withdrawal may lower aquifer levels and spring discharge, adversely affecting the nearby and down-gradient Pahranagat, Moapa Valley and Ash Meadows National Wildlife Refuges, and springs and wetlands connected to the White River Carbonate Flow system, including the Hiko, Crystal, Ash, Moapa, Warm, Rogers and Blue Springs. The FPEIS should include analysis of potential impacts to these sensitive resources and include measures to avoid or minimize those impacts.

D. Soil erosion and associated vegetation impacts

We question the assumption that there should be full removal of existing vegetation in areas to be developed. Proposing development in this manner assumes use of a limited number of technologies with no changes in technology and does not acknowledge that projects can be done in sections and that some accommodation of the natural landscape must be considered.

Impacts to soil resources are some of the most challenging issues for solar projects proposed in the desert. Development of adequate drainage, erosion, and sediment control plans is a complicated, time consuming, and challenging task. Desert soils are particularly fragile, and development can have significant impact on soil crusts. Soil crusts and vegetation play a vital role in retaining desert topsoil; when areas are bladed, a complex of interrelated negative impacts occurs. Biological soil crusts, composed of a community of mosses, lichens, algae, fungi, and bacteria, form a textured, porous layer a few centimeters thick above the ground surface and a fibrous mat that extends below ground, holding topsoil in place, inhibiting the spread of invasive weeds, and facilitating nitrogen fixation and carbon cycling to enhance soil fertility. When these soils are disturbed, the desert land generates more dust and the area is more susceptible to

invasive plant species. Native plant communities as well as soil crusts could take many years to re-establish after disturbance in the arid, low productivity environment of the desert.

Volume 1, Chapter 5 (potential mitigation measures for all SEZs) makes the vague recommendation that disturbance to soil crusts should be avoided to the extent possible, but it does not define the density of soil crusts that would be sufficient to put an area off limits. In many areas soil crusts are sparsely scattered throughout the landscape due to years of disturbance by vehicles and cattle, and it is not clear in this context if destruction of the remaining soil crusts by development would be acceptable because they already have reached such a low density, or if they should be preserved to re-colonize these areas. Chapter 5 contains a short discussion of fugitive dust which states "exposed soil would provide a continual source of fugitive dust throughout the life of the facility, resulting in the long-term deposition of particulates onto plants in the vicinity. Such deposition could lead to long-term changes in plant community composition and productivity in the vicinity of a solar energy facility." DPEIS p. 5-69.

The DPEIS also states that "In areas with highly erodible soils…wind erosion of disturbed soils could affect particulate air quality…based on the large area that could be disturbed and that the fact that stabilization is never fully effective, wind erosion during operation needs to be addressed in site-specific assessments during the ROW application process to assess the severity of these impacts." DPEIS p. 5-147. Chapter 5 mentions that water is not a viable dust control agent in arid areas with water scarcity, that pavement cannot be installed everywhere, that dust suppressants cannot be sprayed everywhere, and that native vegetation should be replanted in temporarily disturbed areas (but not within the facility footprints). Roads and other high use areas as well as temporarily disturbed areas are addressed, but how dust management will be implemented across the large expanses of cleared areas with low traffic is not.

Soil disturbance should be minimized, and any reseeding should be done with native endemic species. Every effort to minimize introduction and spread of non-native species should be employed, including ensuring that reseeding mixtures are not polluted with non-native seed. Impacts of loss of native vegetation should be evaluated.

The FPEIS should include a thorough analysis of the impacts on the soils, including any biological soil crusts, as well as the potential for introducing non-native invasive plant species. We ask that BLM encourage solar developers to limit the impacts to soils and vegetation, minimizing and mitigating where impacts are unavoidable. To ensure robust environmental protections and timely completion of permitting documents and steps, it is critical that the BLM dedicate adequate time and resources early in the process to addressing these issues thoroughly.

Assessment of the existing plant community is essential; surveys of the sites should be done early and at several different times during the year, particularly for any sensitive species. Unfortunately, in a dry ecosystem some species are only present or active for a few weeks each year. In dry years, some plant species will not appear at all, although viable root systems are present underground. Therefore, any historical vegetation or wildlife surveys in these areas should inform the FPEIS.

Destruction of surface hydrologic function is another important impact that should be addressed in the FPEIS. Many potential development areas are located on extensive alluvial fans, containing many ephemeral drainages and incised washes in some cases.

Levick et al. (2008) in a recently released research report on desert ephemeral and intermittent streams, offered the following:

> Ephemeral and intermittent streams provide the same ecological and hydrological functions as perennial streams by moving water, nutrients, and sediment throughout the watershed. When functioning properly, these streams provide landscape hydrologic connections; stream energy dissipation during high-water flows to reduce erosion and improve water quality; surface and subsurface water storage and exchange; ground-water recharge and discharge; sediment transport, storage, and deposition to aid in floodplain maintenance and development; nutrient storage and cycling; wildlife habitat and migration corridors; support for vegetation communities to help stabilize stream banks and provide wildlife services; and water supply and water-quality filtering. They provide a wide array of ecological functions including forage, cover, nesting, and movement corridors for wildlife. Because of the relatively higher moisture content in arid and semi-arid region streams, vegetation and wildlife abundance and diversity in and near them is proportionally higher than in the surrounding uplands. Ephemeral and intermittent stream systems comprise a large portion of southwestern watersheds, and contribute to the hydrological, biogeochemical, and ecological health of a watershed. Given their importance and vast extent, it is concluded that an individual ephemeral or intermittent stream segment should not be examined in isolation. Consideration of the cumulative impacts from anthropogenic uses on these streams is critical in watershed-based assessments and land management decisions to maintain overall watershed health and water quality.

The BLM should include analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts.

E. Soil diseases and toxins

Clearing and leveling of terrain associated with solar development will destroy soil structures such as biological soil crusts and desert pavements and often include near complete vegetation removal subjecting the soil surface to highly erosive winds. Disturbance of playa soils without biological soil crusts has the largest erosive impact as the crushing of the mineral crust leaves the soil surface unprotected (Belnap 2001).

In many areas of the six Southwestern States covered by the PEIS, there are soil-borne diseases and toxins in the dust generated by wind erosion that can be transported considerable distances from the disturbed site.

<u>Valley fever</u>

Coccidioides species is a fungus residing in the top 8 inches of some desert soils that causes a serious and potentially fatal disease known as "valley fever." This fungus thrives in the alkaline desert soils in parts of Arizona, California, Nevada, New Mexico, Texas and Utah. The endemic zones are generally arid to semiarid, with mild winters and long hot seasons (Fisher et al. 2007).

Coccidioides sp. have a complex life cycle. In the soil, they grow as a mold with long filaments that break off into airborne spores when the soil is disturbed. The spores are extremely small, can be carried hundreds of miles by the wind and are highly contagious. Once inside the lungs, the spores reproduce, perpetuating the cycle of the disease.[2]

Anyone who inhales the spores that cause valley fever is at risk of infection. Some experts estimate that up to half the people living in areas where valley fever is common have been infected. People who have jobs that expose them to dust are most at risk — construction, road and agricultural workers, ranchers, archeologists, and military personnel on field exercises. Besides environmental exposure, other risk factors include having diabetes, immune deficiencies, and being non-white, which raises environmental justice concerns.[3]

Mineral aerosols

Perhaps contrary to popular belief, dust can travel great distances from its source, even across oceans and continents, sometimes having negative impacts on human health and distant ecosystems (Husar et al. 2001, Joy 2005, McClure 2009).

In North America, the southwestern deserts are the source of the majority of mineral aerosol emissions. Human activities in these regions have significantly increased the amount of wind erosion and hence dust production and deposition, with broad implications for biogeochemical cycling and impacts to arctic and mountain snowpack depths and melt rates (Neff et al. 2008). As the effects of global climate change continue to affect the six state region, it is very likely that desertification will intensify with the effect of increasing the probability of more dust being produced as vegetative cover decreases and soils dry (Morman 2010).

Scientists at the U.S. Geologic Service have been studying the sources and composition of dust across the desert southwest, from both natural and anthropogenic sources, including in terminal lake valleys in southern California and Nevada in which solar developments are being contemplated in the DPEIS (Reheis et al. 2009).

The studies are finding that dust from terminal lake basins could be transported hundreds of miles and could be a global source of metal-bearing and potentially toxic dust. Not only are they readily available, the dusts are also easily respired and are highly bioaccessible (Reheis et al. 2003, Morman 2010).

[2] http://www.mayoclinic.com/health/valley-fever/DS00695.
[3] Ibid.

While there is some variability between dust sources, all include a mixture of arsenic, chromium, cadmium, lead, copper, nickel and zinc, all potentially toxic to humans (Reheis et al. 2009, Reheis et al. 2003, Morman 2010).

The BLM should include analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts.

F. Habitat connectivity, wildlife movement corridors, and fencing

Various sources of information on habitat connectivity on a landscape level exist that identify key habitats linking large blocks of natural, protected habitat. Landscape-scale habitats that link large blocks of intact habitat that support and sustain all Special Status Species need to be included in the analysis of impacts in each of the alternatives, and in the development of impact avoidance mitigation measures. Such measures may require that areas proposed for solar energy development are fully avoided if they fall within an essential habitat connectivity area.

Regarding fencing, in the state-specific volumes of the DPEIS that address management directives specific to the proposed Solar Energy Zones, it is repeatedly stated that the fencing around solar energy developments should not block the free movement of mammals, particularly big game species. In the section that discusses guidelines for development for areas outside SEZs that are included in the SEDP Alternative, however a different standard for fencing is set forth. Specifically, the DPEIS states that "Fences should be built (as practicable) to exclude livestock and wildlife from all project facilities, including all water sites." DPEIS p. A-57.

Further discussions with BLM staff have made it clear that the requirement to avoid blocking mammal movement was intended to apply to migration corridors and population-level effects on species, not to movements of individual mammals, similar to the categorical exclusions for renewable energy fencing recently proposed by DOE. For example, if a project within a SEZ spanned an important wildlife movement corridor, BLM would recommend it be built in two separate sections or phases, and that those individual facilities would have exclusion fencing around them but movement would be allowed between them. We are relieved to get this clarification, and the BLM should make this clear in the Final PEIS. This clarification negates most of the concerns that we have regarding non-exclusion fencing within projects which include:

- Animals enter the project area and are injured or killed by equipment
- Small mammals overpopulate disturbed ground in project footprints, causing raptors and other predators to be drawn to projects
- Listed species enter projects and are killed, resulting in take
- Large mammals start grazing on cleared land within projects, spreading invasive weeds through increased disturbance and seed transport into the project
- Animals damage equipment, projects have difficulty obtaining funding or insurance due to increased risks associated with fencing that allows animals to enter project areas

Beyond clarifying this question, we urge that fencing recommendations be kept consistent in regarding animal movement for all solar projects on BLM lands. Prescriptions that intend to

avoid impacts to migration corridors should apply to projects both inside and outside of SEZs. In addition, it is important to emphasize that issues around wildlife movement and habitat corridors are landscape-scale issues; they do not receive adequate consideration when approached at the scale of project-level permitting, and should instead be addressed at the scale of individual SEZ regions and beyond. Project-level efforts should then be tailored to be compatible with these landscape-scale migration corridor analyses.

G. Playa wetlands

During the Pleistocene, the Great Basin and Mojave Desert ecoregions were home to many large lakes that filled the valley floors. As the climate changed and became warmer and drier, these lakes eventually dried and became the intermittent wetlands now known as ephemeral lakes or playas (Randall et al 2010).

In the Central Basin and Range Ecoregion, playas are a rare feature on the landscape, constituting only 5.7% of the land area. The associated greasewood flats around the margins of playas constitute another 5.1% of the land area (Crist 2010). The same is true for the Mojave Desert ecoregion. In their ecoregional assessment for the Mojave, The Nature Conservancy set as a goal the protection as conservation targets at least 80% of the available playa habitat in that area (Randall et al. 2010).

Playas and ephemeral wetlands are more than the obvious dry lake bed. The function of this ecosystem depends heavily on the surrounding uplands and the hydrologic functions that deliver water and sediments to the playa (Levick et al. 2008; Liebowitz 2003). The most immediate threat to playas, aside from surface occupancy, is the diversion of water that would otherwise flow onto the playa bed. To protect the ecological function of the playa system, it needs to be managed at the scale of the entire playa and wetland system, including seasonally wetted perimeters and sources of water to the playa (GBBO 2010).

Due to their rarity on the landscape, playas add rare and unique endemism and biological diversity to desert ecosystems (GBBO 2010; Liebowitz, Scot 2003; Comer et al. 2005). Rare and endemic plants such as Parish's phacelia, iodinebush, black greasewood, spiny hopsage, saltgrass, Lemon's alkali grass, and Amargosa nitrophila are found on the playa or in the surrounding ecotone with the uplands (Randall et al 2010; Crist 2010).

Ephemeral wetlands and playas are also very important for some species of birds. Birds that depend on ephemeral wetlands have adapted to the annual variation in water conditions that are typical for these ecosystems, and rely on a network of playas and wetlands to meet their habitat needs from year to year (GBBO 2010). Birds using playas for habitat include snowy plover, black-necked stilt, American avocet, Western sandpiper, least sandpiper, long-billed dowitcher, Wilson's phalarope, marbled godwit and cinnamon teal (GBBO 2010).

Dry lake beds do not engender visions of shrimp, but still, playas provide habitat for specialized and unique aquatic macroinvertebrates such as brine and fairy shrimp, which in turn are important for shorebirds and other ecological functions (Hall et al. 2004).[4]

Clay, silt, salts and sand are contributed to the playa lake beds from seasonal runoff and flood events. These sediments in turn become a primary source of materials for dune systems as well as particulate air emissions (Crist 2010).

Biological soil crusts associated with playas and their associated dunes are very efficient at fixing CO2, particularly as the amount of CO2 in the atmosphere increases. In the case of the *playa* crusts, the net photosynthetic rate of the algae rose by *a factor of two* in going from the ambient CO2 concentration characteristic of their normal environment (385 ppm) to the maximum value the scientists investigated (1000 ppm), while in the case of the *dune* crusts, the net photosynthetic rate *tripled* (Brostoff et al. 2002).

Unfortunately, several of the proposed SEZs, such as Delamar, Dry Lake North and Dry Lake (Apex) in Nevada, overlay and would destroy playas and their ecological functions. It is imperative that the BLM adjust the boundaries of SEZs that impact playas to exclude development on the dry lake bed as well as on the surrounding greasewood flats and other associated ecosystems.

The BLM should include analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts.

H. Desert tortoise relocation

The latest USFWS guidance should be followed for translocation of desert tortoises for any solar projects. The most current guidance is found in the document "Translocation of Desert Tortoises (Mojave population) from Project Sites: Plan Development Guidance" (U.S. Fish and Wildlife Service, August 2010).[5]

In addition to following this guidance, the following guidelines should be followed:

- The USFWS recognizes that translocation of tortoises is still experimental, and study designs of translocations should be set up to test for success in a scientifically rigorous manner.[6]
- Tortoises should only be translocated into the same genetic unit and Recovery Unit.
- Thorough surveys of habitat characteristics of recipient and control sites should be undertaken before project approval, including vegetation cover and composition, surficial geology and substrate suitability for burrows, forage plant quality, and nearness to roads, disturbance, and urbanization.[7]

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[4] Clarke, Chris. 2010. The playa isn't lifeless. Available at: http://faultline.org/index.php/site/item/the_playa_isnt_lifeless .

[5] http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/dt/USFWS%20DT%20Transocation%20Guidance.docx

[6] http://www.deserttortoise.org/abstract/2011DTCSymposiumAbstracts.pdf

[7] Testimony of Dr. Kristin Berry, California Energy Commission hearing for Calico Solar Project, 2010.

- Translocation plans should be finalized before project approvals, and made public for review.

I. Cultural Resource Best Management Practices

We recommend the following "best management practices" for the federal obligation under Section 106 of the National Historic Preservation Act (NHPA) which includes a process for early identification of cultural resources and Traditional Cultural Properties or sacred areas in and adjacent to the Solar Energy Zones (SEZ) as defined in the Draft Programmatic Agreement Environmental Impact Statement for Solar Energy Development in Six Southwestern States (DPEIS). Currently, a lack of inventory, site information, and quality consultation of interested Native American Tribes prevents a reliable idea of quality, number and location of significant cultural resources and sacred areas that may significantly hamper competition of proposed renewable energy projects.

A primary recommendation is that the DPEIS should clearly state that a Record of Decision on the above stated EIS does not preclude the continuing process of consultation with parties in order to comply with Section 106 of the National Historic Preservation Act during subsequent project specific EIS determinations and that requirements to meet applicable part of Section 106 have not yet been made.

These include but are not limited to cultural resources that meet the eligibility criteria for listing on the NRHP are considered "significant" resources and must be taken into consideration during the planning of federal projects. Federal agencies are also required to consider the effects of their actions on sites, areas, and other resources (e.g., plants) that are of religious significance to Native Americans as established under the American Indian Religious Freedom Act (P.L. 95-341). Native American graves and burial grounds are protected by the Native American Graves Protection and Repatriation Act (P.L. 101-601).

The NHPA is the overarching law concerning the management of cultural resources. Numerous other regulatory requirements, however, pertain to cultural properties and are presented below. These laws are applicable to any project undertaken on federal land or requiring federal permitting or funding. The NHPA created the framework within which cultural resources are managed in the United States. Section 106 of the NHPA, defines the process for the identification of a cultural resource and the process for determining if a project will adversely affect the resource. The NHPA establishes the processes for consultation among interested parties, the agency conducting the undertaking, and the SHPO, and for government-to-government consultation between U.S. government agencies and Native American Tribal governments. The NHPA, in Section 106, also addresses the appropriate process for mitigating adverse effects. The NHPA applies to federal undertakings and undertakings that are federally permitted or funded. Cultural resources on BLM-administered land are managed primarily through the application of the above identified laws. Guidance on the application of the laws is provided through PAs developed among the BLM, the National Council of SHPOs, and the Advisory Council on Historic Preservation, and through state-specific PAs concerning cultural resources. Further guidance is provided through the 8100 Series manuals and handbooks, which outline cultural resource management on BLM-administered land.

"Significant Cultural Resource" for purposes of this research which are protected by NHPA are generally 50 years of age or older and meeting National Register of Historic Places NRHP criteria for evaluation (36 Code of Federal Regulations 60.4) which state, in part,

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, materials, workmanship, feeling, and association, and
>
> Criterion A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> Criterion B. that are associated with the lives of persons significant in our past; or
>
> Criterion C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> Criterion D. that have yielded, or may be likely to yield, information important in prehistory or history.

While Historic period sites may be determined NRHP eligible under virtually any of these criteria, prehistoric archaeological sites are almost always evaluated with respect to Criterion D. In other words, to be considered NRHP eligible, a prehistoric site must have yielded, or have the potential to yield

> important information about some aspect of prehistory or history, including events, processes, institutions, design, construction, settlement, migration, ideals, beliefs, lifeways, and other facets of the development or maintenance of cultural systems. . . . Any consideration of a property's eligibility under Criterion D must address (1) whether the property has information to contribute to our understanding of history or prehistory and (2) whether that information is important.

An eligible property must also be at least 50 years old (with a few special exceptions) and retain a certain amount of physical integrity.

Cultural Resources Recommendations

Cultural resources data on public lands in and near the SEZs is incomplete. This coupled with the lack of inventories in and surrounding most of the SEZs, early identification of areas appropriate for development cannot be completed with any assurance of reliability. In fact, the table below illustrates the percentage of inventory within each SEZ in all six states. Sixteen of the SEZ have less than 5 % surveyed and seven of these have less than 1 % completed. No totals were given for seven of the SEZ. However, descriptions suggest that five have low percentages inventoried. Only one SEZ, Dry Lake near Las Vegas NV has been subject to any appreciable amount completed.

We are recommending a two phased approach to increase the quality and amount of data in a relatively cost effective and timely manner. The first is to develop a predictive model using existing data from surrounding areas within the same physiographic and cultural areas. The model should allow the agency to better extrapolate what kinds, location, and the quality of sites will occur in the SEZs in areas that inventoried. The second part includes completing a sample survey to bring the percentage of the inventory up. This will help the agency with selection and

Acreage and percentage of inventory by SEZ in all six states.

SEZ	State	SEZ Acreage	Approx. % Surveyed	Comments
Brenda	AZ	3,878	0	
Bullard Wash	AZ	7,239	0	
Gillespie	AZ	2,618	?	4 linear, 1 block
Imperial East	CA	5,722	?	1 block partially in NW
Iron Mountain	CA	106,522	?	at least 3 linear surveys
Pisgah	CA	23,950	?	at least 19 surveys
Riverside East	CA	202,896	?	at least 109 surveys
De Tilla Gulch	CO	1,522	3.8	
Fourmile East	CO	3,882	0	
Los Mogotes East	CO	5,918	0.2	
Antonito SE	CO	9,729	0	
Afton	NM	77,623	8	
Mason Draw	NM	12,909	2	
Red Sands	NM	22,520	7	
Amargosa Valley	NV	31,625	3	
Delamar Valley	NV	16,552	3.4	
Dry Lake	NV	15,649	60.2	
Dry Lake Valley North	NV	76,874	2.8	
East Mormon Mountain	NV	8,968	0.9	
Gold Point	NV	4,810	0	
Millers	NV	16,787	4	
Escalante Valley	UT	6,614	?	8 linear; 2 block partially in S & W
Milford Flats South	UT	6,480	?	9 mostly linear
Wah Wah Valley	UT	6,097	0.04	

boundary adjustments before PEIS is completed. The agency will be more likely to predict issues that may arise during the requires This will also assist the developer avoid areas that are likely to contain significant cultural resources and the subsequent costs of data recovery or project adjustment.

Native American Consultation

One kind of cultural significance a property may possess, and that may make it eligible for inclusion in the Register, is *traditional cultural significance (*National Register Bulletin 2009*).* "Traditional" in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. The traditional cultural significance of a historic property, then, is significance derived from the

role the property plays in a community's historically rooted beliefs, customs, and practices. Examples of properties possessing such significance include:

• a location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world;

• a rural community whose organization, buildings and structures, or patterns of land use reflect the cultural traditions valued by its long-term residents;

• an urban neighborhood that is the traditional home of a particular cultural group, and that reflects its

• a location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice; and

• a location where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining its historic identity. A traditional cultural property, then, can be defined generally as one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. Various kinds of traditional cultural properties will be discussed, illustrated, and related specifically to the National Register Criteria later in this bulletin.

Native American Concerns Recommendations

Native American consultation under Section 106 of the National Historic Preservation Act must be conducted on all federal undertakings that may have an effect on sites or areas that may be of concern. Not only is there a legal mandate to complete consultation, but it is the right thing to do and is part of good management planning. This consultation should be:

- Meaningful- the agency must make a reasonable and good faith effort to identify consulting parties
- The consultation must fully address tribes concerns
- Government to government consultation must be conducted in person and should be ongoing until parties resolve adverse affects
- Government to government is in addition to the regular public process dictated by NEPA.
- Consultation should consider cumulative effect of this project and others on traditional properties, cultural resources and tribal concerns
- Consultation should consider not only direct effects, but indirect effects on traditional properties

J. Transmission, roads and other associated infrastructure

In addition to ensuring that solar energy generation projects are sited, constructed and operated in an environmentally responsible manner, the BLM should follow similar guidelines for any associated infrastructure, including transmission lines, roads, pipelines and other infrastructure. Though some potential impacts for these associated infrastructure will differ, most of the recommendations included in these comments should also apply for associated infrastructure.

IV. Lands in SEDP Alternative that are not appropriate for development

A significant portion of the area identified as open for solar development in the SEDP Alternative encompasses resources that would be damaged by utility-scale solar projects and should be protected from this level of development. In addition, the presence of these types of land in the SEDP Alternative further underscores the need to select a modified SEZ Alternative and create a process for designating new zones as appropriate. We have included here both recommended screening criteria for utility-scale solar development as well as a number of examples of lands and resources within the SEDP Alternative that need to be protected from development.

In addition, our comments regarding water resources, soil erosion, playa wetlands, habitat connectivity and other overarching issues should also inform the designation of future SEZs.

A. Recommended screening criteria for utility-scale solar development

We recognize that the BLM has included an extensive list of exclusionary screens as part of the DPEIS, detailed in Table 2.2-2. DPEIS p. 2-8. We applaud the BLM's decision to include on this list areas such as Areas of Critical Environmental Concern and areas where there is an applicable land use plan decision to protect lands with wilderness characteristics. However, we are concerned that some areas that are inappropriate for solar development have been left off of BLM's list, and the agency has not placed enough emphasis on the selection of disturbed lands and other priority development areas.

B. Specific examples of lands in the SEDP Alternative in Nevada that are not appropriate for development

Below is a table listing the results of analyses on impacts to wildlife and their habitats for the SEDP Alternative. Values are either total acres where solar development will be permitted within a specific wildlife habitat or movement corridor or are counts of records found within the developable lands. Of particular note is the sage-grouse core breeding habitat completed by the BLM in December, 2010. This example underscores a disconnect between the potential listing of the sage-grouse and the associated impacts to future activities on public lands, including the development of renewable energy and transmission infrastructure.

Another important type of conflict with the SEDP Alternative lands is with Citizen Inventoried Lands with Wilderness Characteristics. These are lands have been inventoried by various citizens groups, conservationists, and agencies and found to have "wilderness characteristics," including naturalness, solitude and the opportunity for primitive recreation. Beyond these core values, these lands also provide important wildlife habitat, cultural and scientific resources,

invaluable ecosystem services including clean air and water, important economic benefits, and many other resources and values. The sensitive nature of these lands and their resources and values makes their protection critical and solar energy development inappropriate for these lands.

Wildlife Criteria	**Amount Impacted**
Bighorn Movement Corridors – acres	128,786
Bighorn Occupied habitat – acres	108,928
Citizen Inventoried Lands with Wilderness Characteristics – acres	143,936
Elk Movement Corridors – acres	92,202
Heritage Program individuals globally ranked imperiled or critically imperiled	160
Heritage Program individuals state ranked imperiled or critically imperiled	236
Heritage Program Species globally ranked imperiled or critically imperiled	30
Heritage Program Species state ranked imperiled or critically imperiled	58
Mule Deer Corridor – acres	777,183
Mule Deer Crucial Winter Habitat – acres	184,958
NDOW records: “species of conservation concern”	28,016
NDOW records: endangered species	16
NDOW records: threatened species	126
Number of citizen inventoried lands with wilderness characteristics	28

Wildlife Criteria	Amount Impacted
Number with >1000 Acres	22
Pronghorn Corridor – acres	370,733
Pronghorn Crucial Winter Habitat – acres	19,086
Raptor Nests	282
Sage-grouse Core Breeding Habitat (100%) – acres	1,099,207
Sage-grouse Core Breeding Habitat (50%) –acres	101,552

- **Cultural resources**

The SEDP Alternative also includes areas with significant cultural resources that are not appropriate for development. In particular we highlight:

- *Area West of Delamar Valley SEZ:* The BLM should exclude areas to the west and south of the Delamar Valley SEZ from solar energy development because of their significant concentrations of petroglyphs.

- *"Double Negative" Art Installation:* Located south of Interstate 15 near the town of Overton, the area surrounding this 1969 geological art installation should be excluded from solar energy development to protect it from physical and visual impacts.

V. Solar Energy Zones

We have included a significant amount of information regarding the SEZs, including recommended boundary revisions, areas where additional analysis is needed, and flags of sensitive resources that will need to be addressed with further site-specific, project-level review, opportunities for responsible development, recommended mitigation measures, and corrections. We would welcome the opportunity to meet with the BLM in person to discuss our recommendations in detail. We would be happy to bring maps detailing resource issues and provide additional information as is helpful.

These recommendations are intended to help the BLM make the SEZs as useful as possible in facilitating responsible and efficient permitting of projects there. The recommendations are <u>not</u>

intended to convey general opposition to the SEZs. Rather, it is our hope that if the BLM follows our recommendations, the agency may be able to complete additional analyses necessary to allow projects to more effectively tier environmental reviews to the PEIS, and ultimately facilitate efficient and responsible development there.

Though the volume of information included on the SEZs may appear to indicate that the SEZs are generally problematic, and there are in fact significant concerns about a few of the SEZs, we strongly caution against interpreting the detailed nature of these comments to imply opposition to the SEZs across the board. Rather, we underscore the importance of focusing on the SEZs rather than the additional 9,084,050 acres included in the SEDP Alternative in Nevada. The SEZs have already benefited from significant screening and analysis, and we believe that the issues raised below can be addressed by following our recommendations to allow efficient and responsible development in the SEZs. The SEDP Alternative has not benefitted from this screening and analysis. Beyond the specific issues raised for these lands in Section IV, we expect that volumes of additional issues and challenges would be found on many of the SEDP Alternative lands were they subjected to the scrutiny that the SEZs have seen.

A. Delamar Valley SEZ

i. Overview

The Delamar Valley SEZ is located southeastern Nevada in Lincoln County about 21 miles south of the proposed Dry Lake Valley North SEZ. The SEZ has a total area of 16,552 acres. Delamar Valley SEZ is isolated and undeveloped. The SEZ is located in Delamar Valley, a north trending closed basin within the Basin and Range physiographic province immediately south of Dry Lake Valley and lying between the South Pahroc Range to the west and the Delamar Mountains to the east and southeast. Land within the SEZ is undeveloped scrubland characteristic of a high-elevation, semiarid basin. The southern portion of this SEZ is a dry lakebed; it is unclear if the likelihood of blowing sands and seasonal flooding associated with the dry lakebed are compatible with some solar technologies.

The site is within the Delamar Valley groundwater basin which is geologically connected to Dry Lake Valley and other basins in the White River Carbonate Flow system. Flows from this system feed Pahranagat National Wildlife Refuge and numerous springs along its course including Hiko, Crystal, Ash, Moapa Warm, Rogers and Blue Springs, all habitat for listed, candidate or sensitive desert fish, springsnails and other aquatic/riparian life.

The largest nearby town is Alamo, Nevada, about 11 miles to the west. The town of Caliente is 22 miles to the northeast and Panaca is located about 11 miles further north. Las Vegas lies about 90 miles to the south. The nearest major road access to the SEZ is via U.S. 93, which runs north–south, approximately 8 to 14 miles to the west of the Delamar Valley SEZ and also east–west, approximately 8 miles to the north of the SEZ. State Route 317 passes from the north to the south approximately 16 to 21 miles east of the SEZ. The nearest railroad stop is in Caliente and the Lincoln County Airport is located in Panaca. Future transmission needs can potentially be met with the Southwest Intertie/On Line/One Nevada transmission line that was approved in 2010 as a fast-track project.

As of March 2010, there were two ROW applications for solar projects and one application for a wind project that would be located within 50 miles of the SEZ.

Overall, the area as modified does not have major conflicts, and provided the BLM addresses the concerns below, we support the designation of this area as a Solar Energy Zone.

ii. Overarching issues for this SEZ

None noted.

iii. Recommended boundary adjustments

As currently drawn, the SEZ includes some areas that are not appropriate for designation as a SEZ. We would like the BLM to revise the boundary of the SEZ as shown in the included map as the green area labeled "American Solar Energy Pilot Act" (Fig. 1).

This boundary recommendation was developed during a collaborative process that included many stakeholders including ranchers, ORV advocates, conservation groups and Lincoln County officials. This consensus boundary was adopted by Senator Reid and Congressman Heller and introduced in legislation in 2010's American Solar Energy Pilot Leasing Act.

iv. Sensitive natural resources and recommended additional impacts analysis

The sensitive resources highlighted below require special attention and additional analysis in the BLM's Final PEIS and in analysis for individual projects proposed within the SEZ.

- **Public trust resources.**

The DPEIS has not discussed the potential impacts on public lands and resources, particularly Pahranagat and Moapa Valley National Wildlife Refuges. Groundwater withdrawals may lower aquifer levels and spring discharge, adversely affecting the nearby wildlife refuges and their aquatic and riparian habitats. These refuges and surrounding lands and waters are habitat for several listed species and hundreds of migratory birds. The use of water as proposed under the alternative may interfere with water rights held by the Fish and Wildlife Service specifically to protect these waters and water-related resources. BLM must evaluate the potential impacts to these public lands, their missions and their fish and wildlife.

- **Species of concern.**

There are 49 special status species that could potentially be impacted by development within the SEZ, although very little habitat exists within the SEZ itself. Much of the SEZ is on a dry lakebed. It should be noted that bighorn migration corridors to the south between the Desert Refuge and the Delamar and Meadow Valley Ranges may be negatively affected by future transmission development associated with this site. We would like to work with the Nevada

Division of Wildlife, USFWS, the BLM and other appropriate agencies to ensure landscape permeability for bighorn sheep as transmission development proceeds.

Because of the possible groundwater impacts within the White River Carbonate Flow System, several spring, riparian and aquatic species are of concern. The Hiko White River springfish, White River springfish, Pahranagat roundtail chub, Moapa dace, Virgin River chub, woundfin and Southwest willow flycatcher are all potentially impacted and currently protected under the ESA.

In addition, the Moapa pebblesnail, grated tryonia, Pahranagat pebblesnail, Hubbs pyrg, Flag springsnail, and Blue Point springsnail are all species that have been petitioned for listing and awaiting a determination by the Fish and Wildlife Service.

The Paharnagat Valley montane vole, Pahranagat dace, Meadow Valley speckled dace and the Meadow Valley Wash desert sucker are additional species of concern potentially impacted by groundwater withdrawals. The BLM should include in the FPEIS analysis of these potential impacts and measures to minimize or mitigate any such impacts.

- **Groundwater availability to support development.**

The Delamar groundwater basin is fully appropriated. Until the BLM performs an analysis of water use requirements using the correct figures for perennial yield and existing and permitted use, neither the BLM nor the reader can make an informed decision regarding the appropriate level of development of the feasibility of solar technologies in this SEZ.

Using, for example, the BLM's assumptions regarding water availability in Delamar Valley, the limited and almost completely allocated perennial yield for this basin (2,550 afy, 50 afy unallocated), makes it likely that only non-cooled or limited dry-cooled projects would be feasible in this area, unless significant advances to cooling technologies and associated water requirements occur and assuming water could be acquired from existing water rights holders. While ruling out wet-cooling technologies, the DPEIS leaves the door open for dry-cooled technologies which would need between 1,046 to 4,009 afy at 80% buildout of the SEZ and non-cooled technologies requiring 76 to 752 afy at 80% buildout of the SEZ.

The BLM also fails to look critically at the water needs at each stage of solar development. While we agree that PV is the preferred technology in this valley the assumed perennial yield will not support the peak construction year water needs for PV for concurrent construction of multiple projects. *See* DPEIS Table 11.2.9.2-1 (requiring 2,743 afy versus 2,550 afy yield). In fact, the assumed perennial yield is not sufficient to supply *any* technology during the peak construction year, except for parabolic trough, but the DPEIS fails to recognize this. *Compare* DPEIS 11.2-63 ("The availability of groundwater and the potential impacts of groundwater withdrawal would need to be assessed during the site characterization phase."). The FPEIS should include analysis of whether there is enough water to support construction during peak construction year, and to support construction and operations simultaneously.

Using the DPEIS's more generous assumptions regarding perennial yield (with which we disagree, see below), regardless of the technology employed a developer would have to negotiate with SNWA and NDWR; even if only PV systems are constructed in the SEZ there still is not enough water within the unallocated perennial yield for just their operation. *Compare* DPEIS Table 11.2.9.2-2 (requiring 76 afy versus 50 afy unallocated yield). Moreover, while BLM may conclude – despite failing to perform the analysis above – that PV is the preferred technology for this SEZ, there is nothing in the General or SEZ-specific design features committing to this preference. BLM must revise its analysis to reflect the proper baseline, scale back the peak construction year and full build-out scenarios to a level commensurate with the available water supply, and ensure that any water use follows the design features and recommendations in Section III above.

- **BLM's unreasoned assumptions regarding groundwater availability in Delamar Valley.**

BLM must revise its assumptions and resultant analysis regarding water use and water rights management, *see, e.g.*, DPEIS 11.2-60—61, 11.2-65, 11.2-67, 11.2-336, to clarify that Ruling 5875 has been vacated and that the perennial yield newly established in Ruling 5875 and water rights granted to SNWA are also vacated. As a result, the DPEIS baseline analysis should reflect that the basin is already fully appropriated. *Carter-Griffin v. Taylor*, CV 0830908 (Oct. 15, 2009), slip op. at 5 (citing Ruling 5875) ("all water rights previously available in [Delamar basin] had already been fully appropriated").[8] BLM also assumes, without justification, that even if these water rights were valid, that developers would be able to secure a significant portion of those rights for solar energy development.

- **DPEIS fails to consider impacts to all potentially affected groundwater-dependent species and groundwater-supported habitats.**

In its scoping comments regarding the proposed Delamar Valley SEZ, FWS expressed concern that groundwater withdrawals may reduce the regional groundwater supply that supports spring-fed aquatic habitats in the SEZ region, including habitats in the White River, Pahranagat, and Moapa Valleys. BLM relies on discussion in Section 11.2.9.2 to omit consideration of impacts to special status species in the Moapa Valley – i.e., Moapa pebblesnail, Moapa Valley springsnail, Moapa Warm Spring riffle beetle, Big Spring spinedace, Moapa dace, Moapa speckled dace, Moapa White River springfish, Pahrump poolfish, Railroad Valley springfish, and White River spinedace). DPEIS 11.2-138 (claiming section 11.2.9.2 demonstrates that groundwater in the Delamar Valley is not a major contributor to the far northern or far southern extents of the White River Valley regional groundwater system). BLM has not responded to the valid concerns of its sister agency – section 11.2.9.2 makes no such analysis.

[8] Two separate challenges were brought to Ruling 5875, and the district court vacated and remanded the ruling back to the NSE. *See Carter-Griffin v. Taylor*, CV 0830908 (Oct. 15, 2009); Ruling 5875 (vacated Oct. 19, 2009), available at http://images.water.nv.gov/images/rulings/5875r.pdf. The Nevada Supreme Court dismissed appeals as rendered moot by *GBWN v. Taylor*. *SNWA et al. v. Carter-Griffin*, No. 54986 (Sept. 13, 2010). In *GBWN v. Taylor*, 234 P.2d 912 (Nev. 2010), the Nevada Supreme Court reversed the order of the district court and directed the State Engineer to re-notice the applications in Cave, Dry Lake and Delamar Valleys and re-open the protest period.

In fact, in protesting the very SNWA applications again pending before the State Engineer, BLM was concerned that pumping in Dry Lake Valley would impact (via flow reduction) Delamar Valley. The loss of interbasin flow would impact special status species in Pahranagat Valley and ultimately in the Muddy River Springs Area. "An adverse impact on the stream, lakes and contributing springs in Pahranagat Valley, as well as the Muddy River Springs Area could result in a reduction of associated riparian vegetation which, in turn, may impact those endangered and candidate species previously discussed." *See, e.g.,* In the Matter of Application Number 53989, available at http://water.nv.gov/hearings/Dry_Cave_Delamar%20hearings/SNWA/Volume_1/211/211_U.S.%20Department%20of%20the%20Interior.pdf. The BLM should analyze potential impacts to all potentially affected groundwater-dependent species and groundwater-supported habitats n the FPEIS, and include measures to avoid or minimize those impacts.

v. Opportunities for environmentally responsible development

The BLM can limit impacts and maximize benefits from solar energy development on this SEZ by following the recommendations below.

- The Joshua tree habitat along the north portion of the SEZ should be avoided.
- The SWIP Transmission line corridor, oriented in an approximate north-south direction, is situated in the approximate middle of the SEZ. The SWIP is currently under construction and will dramatically add transmission capacity along its route. Although the SWIP will add cumulative impacts to the area, it is likely that the construction of the SWIP will make other new transmission construction unnecessary to support this SEZ designation. The Valley Electric Association owns the existing138-kV transmission that runs parallel to U.S. 95 adjacent to the SEZ.
- The proximity of US 95 and a wide graded dirt road for transmission Right-of-way provides access to the SEZ. The graded road is maintained regularly by Lincoln County.
- Given the very limited water resources available in this area, and pending a revised baseline analysis by BLM, it appears that BLM may need to scale back the peak construction year and full build-out scenarios and ensure that any water use follows the standards set out in Section III.

vi. Corrections

Although there is an existing 69-kV transmission line passing through the SEZ, the SWIP line, now under construction will add capacity to 500 kV in its first phase of development.

The BLM will be issuing a Notice of Intent for Wilson/Table Mountain Wind project before the FPEIS is complete. This project, if completed, is within 50 miles of the Delamar Valley and should be added to the cumulative effects table of other renewable energy projects.

The DPEIS fails to list as Special Status Species in the SEZ region the following: Moapa dace, Virgin River chub, woundfin, Moapa pebblesnail, Hubbs pyrg, Flag springsnail, and Blue Point

springsnail, Pahranagat dace, Meadow Valley speckled dace and the Meadow Valley Wash desert sucker.

B. Amargosa SEZ

i. Overview

The Amargosa Valley SEZ lies towards the northern end of the Amargosa Valley and is effectively located along the ephemeral Amargosa River between the Bare and Funeral Mountain Ranges. Amargosa Valley and Highway 95 are portals to Death Valley National Park. The SEZ is in the Amargosa Desert Groundwater Basin which is a part of the regional-scale Death Valley Regional Groundwater Flow System. Groundwater from the Amargosa Desert Basin terminates at the multiple springs in and around the Ash Meadows National Wildlife Refuge and Devil's Hole component of the Death Valley National Park. The area is desert tortoise habitat, nearing the current upper elevation limits for that species.

There are four other solar projects in the Valley or immediate area that have been approved or that are in various stages of NEPA analysis:

- Amargosa Farm Road – 4350 acres, parabolic trough
- Lathrop Wells – 1920 acres, photovoltaic and trough
- Amargosa North – 7500 acres, photovoltaic
- Solar Demonstration Project on the Nevada National Security Site – 300 acres, to be determined.

In addition, there are approximately 110,000 acres of other renewable energy projects with pending rights-of-way applications within 50 miles of the proposed SEZ.

While aspects of this proposed SEZ have significant environmental concerns associated with them, we believe that with proper siting and design an appropriate SEZ can be designated, and provided the BLM addresses the concerns raised in our comments, we support the designation of our recommended area as a Solar Energy Zone.

ii. Overarching issues for this SEZ

The overarching issues highlighted below should be addressed by the BLM in the Final PEIS and in analysis for individual projects proposed within the SEZ.

- **Impedance to desert tortoise adaptations to a warming and drying climate.**

As noted in the DPEIS, prediction on future climate for this area consistently point to a warmer and drier regime. As Mojave Desert conditions migrate northward and upslope, it is quite likely that the desert tortoise will follow them, perhaps being at risk of extinction if they do not.

The location of the SEZ as currently located at a "pinchpoint" that effectively blocks this northward migration of tortoises in the Eastern Mojave Recovery Unit. A cleared and industrialized site between the Funeral and Bare Mountains, exacerbated by the Highway 95 and

utility corridors would leave no opportunity for tortoises from south of the SEZ to get past and into the evolving desert beyond.

The Desert tortoise populations of the Amargosa Valley and Pahrump Valley have been found to be genetically isolated and may have evolutionarily important genetic uniqueness. It is suggested that parts of this population could qualify as an Evolutionarily Significant Units (ESU). These would require special management. Delineation of Desert Wildlife Management Areas was based on both ecological and genetic considerations and their locations and boundaries have not been finalized (Britten et al. 1997). The BLM should include analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts.

- **Cumulative impacts**

The DPEIS fails to adequately analyze cumulative impacts because it merely notes the possible types of on-going and reasonably foreseeable projects and their sizes, but not their impacts on actual resources. Consider two examples:

Desert tortoise and other special status species – The SEZ lies in the proposed Eastern Mojave Recovery Area for desert tortoise and contains suitable current desert tortoise habitat as modeled in the proposed recovery plan (USFWS 2008). As previously outlined, there are 14,070 acres encompassed in projects that have already been approved or that are in active NEPA analysis in the cumulative impacts analysis area for the Amargosa Valley SEZ. The SEZ estimates that it would add another 25,300 acres of development over a 20 year analysis horizon. Many if not all of these acres are within suitable desert tortoise habitat. Yet, nowhere in the DPEIS does the BLM analyze or disclose the potential impacts and effects of over 39,000 acres of habitat being destroyed with regards to the desert tortoise and other special status species associated with the habitat types in the affected area.

Groundwater withdrawals and special status species and their habitats — Despite having the data necessary to estimate the cumulative impacts of water use on groundwater-dependent species, BLM claims that "[i]mpacts of groundwater depletion from solar energy development in the Amargosa Valley SEZ cannot be quantified without identification of the cumulative amount of groundwater withdrawals needed to support development on the SEZ." DPEIS 11.1-194. BLM has estimated low and high water demands for construction and operation within the SEZ (*see* DPEIS Tables 11.1.9.2-1 and 11.1.9.2-2) and is capable of estimating water demands of nearby projects (*see* Table 11.1.22.2-2) – BLM simply needed to incorporate this information into a regional groundwater model that could project the impacts of groundwater pumping on species habitats but failed to do so. *Compare* BLM, Amargosa Farm Road Solar Energy Project Final EIS (2010) at Chapter 4.4, Appendix B (utilizing Death Valley Regional Flow System Model to evaluate effects of pumping 400 afy on groundwater dependent species at Devil's Hole and Ash Meadows). Failure to model these impacts renders BLM's conclusion that "[t]he implementation of programmatic design features and complete avoidance or limitations of groundwater withdrawals from the regional groundwater system would reduce impacts on the groundwater-dependent species to small or negligible levels" unsupportable. DPEIS 11.1-194.

The BLM should include analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts.

iii. Recommended boundary adjustments

The Amargosa River and its 100-year flood channel should be left undisturbed and buffered for wildlife and plant habitat, flood control and the preservation of hydrologic function. The same is true of the secondary wash that is tributary to the Amargosa River. In addition, these two exclusions would provide valuable wildlife movement corridors and a possible route for desert tortoise adaptation to climate change, An area to the north of the proposed SEZ and between the Amargosa River and Highway 95 could be considered as an addition to the SEZ.

iv. Sensitive natural resources and recommended additional impacts analysis

The sensitive resources highlighted below require special attention and additional analysis in the BLM's Final PEIS and in analysis for individual projects proposed within the SEZ.

- **Public Trust Resources.**

The DPEIS has not discussed the potential impacts of groundwater withdrawals on public lands and resources, particularly Ash Meadows National Wildlife Refuge, Devil's Hole, Amargosa Mesquite Trees ACEC and other protected and sensitive areas. Groundwater withdrawals may lower aquifer levels and spring discharge, adversely affecting the nearby wildlife refuges and their aquatic and riparian habitats. These refuges and surrounding lands and waters are habitat for several listed species and hundreds of migratory birds. The use of water as proposed under the alternative may interfere with water rights held by the Fish and Wildlife Service and the BLM specifically to protect these waters and water-related resources. BLM must evaluate the potential impacts to these public lands, their missions and their fish and wildlife.

- **Groundwater availability to support development.**

As correctly noted in the DPEIS, the Amargosa Desert Groundwater Basin is over appropriated, and water management is guided by a U.S. Supreme Court decision and several State Engineer Orders to protect the rare and imperiled species found at Ash Meadows and Devil's Hole. DPEIS p. 11.1-60. Under these rulings, the only groundwater option available to potential developers is to secure existing water rights and change the type of use and point of diversion. It is noteworthy that the DPEIS discloses the fact that the water level at Devil's Hole has been declining in the period of 1988-2004, presumably due to regional-scale groundwater withdrawals. DPEIS 11.1-332.

Given that the Amargosa Basin is over-appropriated (by 18,335 afy) and overdrafted (by 9,380 afy), it seems likely that only non-cooled or limited dry-cooled projects would be feasible in this area, unless significant changes to cooling technologies and associated water requirements are made and assuming all water used could be acquired from existing water rights holders. While ruling out wet-cooling technologies, the DPEIS leaves the door open for dry-cooled technologies

which would need 2,000 to 7,660 afy at 80% buildout of the SEZ, and non-cooled technologies requiring 144 to 1,438 afy at 80% buildout of the SEZ.

The BLM similarly glosses over the large amount of water needed during construction – up to 70% of the "available" perennial yield – in a peak construction year. The DPEIS does not take a critical look at whether there is enough water to construct and then operate a given solar project.

The BLM must revise its analysis, scale back the peak construction year and full build-out scenarios to a level commensurate with the available water supply, and ensure that any water use follows the design features and recommendations in Section III above. Groundwater withdrawal impacts should be measured, such as requiring piezometers in test wells, and measuring phreatophyte die-off for the Amargosa Valley.

- **Amargosa River hydrology**

The Amargosa River runs through the central portion of this SEZ. The river originates in the mountains surrounding Beatty, NV, and after leaving the Oasis Valley the river flows only underground, except during floods, much of the way to its terminus at Bad Water in Death Valley National Park. A 17 mile stretch in California is again surface flow and has been designated as a Wild and Scenic River, and portions of its course have also been designated as BLM Areas of Critical Environmental Concern. This river is a major ecological and hydrological feature. Where flows are perennial, the river provides lush riparian and wetland habitats that support endemic and sensitive species such as the endangered Amargosa vole and the sensitive Amargosa toad. In the dry wash portions, the river provides habitat for endemic plants and animals, including the desert tortoise which frequently burrows into the wash's banks and caliche caves.

There is another major intermittent surface flow feature that runs inside the proposed SEZ's western and southern boundaries. This wash drains into the Amargosa River near the eastern SEZ boundary. Disruption of the above- and below-ground flows of this river system have the potential to negatively impact off-site features of concern.

- **Desert tortoise**

Project-specific surveys must be conducted, with full avoidance of tortoise habitat and travel corridors, fencing to protect tortoises from mortality, as well as on-site and off-site mitigation as needed. Translocation of individuals has proven to have limited success, and any translocation should follow the recommendations found in Section III, above.

- **Endemic dune beetles**

Special surveys should be undertaken by qualified entomologists for sand insect faunas across the SEZ, as some dune beetles are found on very small islands of sand and sand flats to the north and east of Big Dune, so potentially could be on the SEZ (Derham Giuliani, personal comm. 2010).

- **Sand transport corridor**

The Amargosa Valley SEZ has the potential to block winds that feed Big Dune sand from the Amargosa River source areas, as well as from other sources. A study should be included in the FPEIS to determine the nature and extent of sand transport corridors in Amargosa Valley, and what mitigation measures will be needed if a large fenced area will be places in such corridors.

Tall wind fences may be necessary to shield solar projects from blowing wind and sand. These should be modeled in visualizations and their visual impacts to recreationists in Death Valley National Park analyzed.

v. Opportunities for environmentally responsible development

The BLM can limit impacts and maximize benefits from solar energy development on this SEZ by following the recommendations below.

- Through site specific design, there may be an opportunity to allocate a desert tortoise/wildlife movement corridor through the SEZ, at least partially eliminating the genetic and adaptation bottleneck that would exist if the entire area was made inhospitable or inaccessible to wildlife.

- Given the very limited water resources available in this area, it appears that BLM may need to scale back the peak construction year and full build-out scenarios and ensure that any water use follows the design features and recommendations made in Section III.

vi. Corrections

The PDEIS fails to list Lathrop Wells and the Solar Demonstration Project on the Nevada National Security Site as “reasonably foreseeable future action” in Table 11.1.22.2-1, and treat them as such in its analysis.

C. Dry Lake Valley North SEZ

i. Overview

The Dry Lake Valley North SEZ is located in Lincoln County in southeastern Nevada. The SEZ has a total area of 76,874 acres. The SEZ is located in the Dry Lake Valley, Lincoln County and is bounded by mountain ranges on the east and west. The North Pahroc Range is situated about 6 miles west of the SEZ, and the West Range, Bristol Range, Highland Range, Ely Springs Range, Black Canyon Range, and Burnt Springs Range occur east of the SEZ. No permanent surface water sources occur in the proposed SEZ. Vegetation is generally sparse, with large areas of low grasses and low-height scrubland. The closest population centers to the SEZ are Pioche, located about 15 miles to the east, and Caliente, located about 15 miles to the southeast; both communities have populations of about 1,000. The smaller communities of Caselton and Prince are located about 13 miles to the east of the SEZ. Las Vegas is located about 110 miles to the south. The nearest major road to the Dry Lake Valley North SEZ is State Route 318, which is

about 7 miles to the west of the SEZ, while U.S. 93 is about 8 miles to the south. Access to the interior of the SEZ is by dirt roads. The nearest railroad access is approximately 25 miles away, while nearby airports include Lincoln County Airport in Panaca and Alamo Landing Field in Alamo, which are located about 13 miles south–southeast of and 35 miles southwest of the SEZ, respectively.

The site is within the Dry Lake Valley groundwater basin which is geologically connected to Delamar Valley and other basins in the White River Carbonate Flow system. Flows from this system feed Pahranagat National Wildlife Refuge and numerous springs along its course including Hiko, Crystal, Ash, Moapa Warm, Rogers and Blue springs, all habitat for listed, candidate or sensitive desert fish, springsnails and other aquatic/riparian life.

Currently there is one pending solar application and eight wind applications in various stages of approval on public lands within 50 miles of the SEZ, which represent additional potential developments. In addition, several new electric transmission projects and a groundwater transfer pipeline project represent foreseeable developments that would pass through or near the proposed SEZ.

While aspects of this proposed SEZ have significant environmental concerns associated with them, we believe that with proper siting and design an appropriate SEZ can be designated, and provided the BLM addresses the concerns raised in our comments, we support the designation of our recommended area as a Solar Energy Zone.

ii. Overarching issues for this SEZ

None noted.

iii. Recommended boundary adjustments

As currently drawn, the SEZ includes some areas that are not appropriate for designation as a SEZ. The BLM should revise the boundary of the SEZ as indicated below.

We recommend moving the boundaries to avoid important wildlife habitat and other sensitive natural resources, including habitat for Desert Kangaroo mouse, desert horned lizard and burrowing owl, as well as Eastwood milkweed. The included map shows a consensus zone in green that was included in federal legislation introduced in 2010 in the American Solar Energy Pilot Leasing Act by Senator Harry Reid and Congressman Dean Heller (Fig. 2). Because this boundary was agreed upon by a wide consensus of stakeholders including conservation groups, local government, ranches, and ORV users, we support this area as a Dry Lake Valley North Solar Energy Zone. The map also shows sensitive habitat for the kangaroo mouse.

iv. Sensitive natural resources and recommended additional impacts analysis

The sensitive resources highlighted below require special attention and additional analysis in the BLM's Final PEIS and in analysis for individual projects proposed within the SEZ.

- **Groundwater availability to support development**

The Dry Lake Valley Basin is fully appropriated. Until the BLM performs an analysis of water use requirements using the correct figures for perennial yield and existing and permitted use, neither BLM nor the reader can make an informed decision regarding the appropriate level of development of the feasibility of solar technologies in this SEZ.

Using, for example, BLM's assumptions regarding water availability in Dry Lake Valley, the limited and almost completely allocated perennial yield for this basin (12,700 afy, 50 afy unallocated), makes it likely that only non-cooled or limited dry-cooled projects would be feasible in this area, unless significant changes to cooling technologies and associated water requirements are made and assuming the bulk of any water used could be acquired from existing water rights holders. Wet-cooling technologies are deemed infeasible in the DPEIS, but dry-cooled technologies are not, needing 4,858 to 18,616 afy for 80% buildout of the SEZ. Non-cooled or scaled back dry-cooled projects appear most realistic.

The BLM fails to look critically at the water needs at each stage of solar development. The DPEIS does not take a hard look at whether there is enough water to support construction and operation simultaneously.

Though the ratio of operational water requirements for dry-cooled technologies to assumed perennial yield is similar to that of the Delamar Valley SEZ – commanding from 33% to 150% of perennial yield – the DPEIS does not express the same preference for technologies that do not require water for cooling. BLM must revise its analysis to reflect the proper baseline, scale back the peak construction year and full build out scenarios to a level commensurate with the available water supply, and ensure that any water use follows the design features and recommendations in Section III above.

- **BLM's unreasoned assumptions regarding groundwater availability in Dry Lake Valley**

BLM must revise its assumptions and resultant analysis regarding water use and water rights management, *see, e.g.*, DPEIS 11.4-63, 11.4-67, to clarify that Ruling 5875 has been vacated and that the perennial yield newly established in Ruling 5875 and water rights granted to SNWA are also vacated. As a result, the DPEIS baseline analysis should reflect that the basin is already fully appropriated. *Carter-Griffin v. Taylor*, CV 0830908 (Oct. 15, 2009), slip op. at 5 (citing Ruling 5875) ("all water rights previously available in [Dry Lake Valley basin] had already been fully appropriated").[9]

[9] Two separate challenges were brought to Ruling 5875, and the district court vacated and remanded the ruling back to the NSE. See Carter-Griffin v. Taylor, CV 0830908 (Oct. 15, 2009); Ruling 5875 (vacated Oct. 19, 2009), available at http://images.water.nv.gov/images/rulings/5875r.pdf. The Nevada Supreme Court dismissed appeals as rendered moot by GBWN v. Taylor. SNWA et al. v. Carter-Griffin, No. 54986 (Sept. 13, 2010). In GBWN v. Taylor, 234 P.2d 912 (Nev. 2010), the Nevada Supreme Court reversed the order of the district court and directed the State Engineer to re-notice the applications in Cave, Dry Lake and Delamar Valleys and re-open the protest period. Moreover, any agreement by SNWA to "commit 1,500 ac-ft/yr (1.9 million m3/yr) of those water rights to Lincoln County for use,"

- **Species of concern**

Because of the possible groundwater impacts within the White River Carbonate Flow System, several spring, riparian and aquatic species are of concern. The Hiko White River springfish, White River springfish, Pahranagat roundtail chub, Moapa dace, Virgin River chub, woundfin and Southwest willow flycatcher are all potentially impacted and currently protected under the ESA.

In addition, the Moapa pebblesnail, grated tryonia, Pahranagat pebblesnail, Hubbs pyrg, Flag springsnail, and Blue Point springsnail are all species that have been petitioned for listing and awaiting a determination by the Fish and Wildlife Service.

The Paharnagat Valley montane vole, Pahranagat dace, Meadow Valley speckled dace and the Meadow Valley Wash desert sucker are additional species of concern potentially impacted by groundwater withdrawals. The BLM should include in the FPEIS analysis of these potential impacts and measures to minimize or mitigate any such impacts.

Twenty-two special status animal species could be affected by solar energy development on the SEZ. A total of 21 BLM-designated sensitive species may occur in the affected area of the Dry Lake Valley North SEZ or may be affected by solar energy development on the SEZ. Eastwood milkweed appears in the NNHP dataset for the area and should be avoided. The Desert Valley kangaroo mouse, desert horned lizard and burrowing owl are present based on the NDOW data. Burrowing owl colonies and Desert Valley kangaroo mice areas should also be avoided.

The Desert Valley kangaroo mouse has been well-studied by mammalogist John Hafner of Occidental College. His collections and genetic analysis have shown that this is a biological species with limited distribution in only several valleys in eastern Nevada and western Utah. A manuscript is currently under scientific peer-review to provide support for this species designation. Because of their limited distribution, this species and its habitats need to be avoided. Our recommended boundary avoids these habitats to minimize impacts to the species.

We are happy to provide map data to the BLM under separate cover. Overall, this site has numerous roads and a relatively high incidence of annual grass invasion along the east based on modeling of annual grasses for Nevada by NNHP. The prevalence of several rare or important species warrants careful monitoring of impacts from development and significant adjustments to the proposed zone, as recommended above.

v. Opportunities for environmentally responsible development

The BLM can limit impacts and maximize benefits from solar energy development on this SEZ by following the recommendations below.

DPEIS 11.4-63, has been called into question by the state engineer through his finding that the place of use for SNWA's applications was restricted to Clark County. See Ruling 5875 (vacated on other grounds, Oct. 19, 2009), at 7-8.

- With a boundary adjustment discussed above, impacts to unique wildlife species can be minimized or avoided.
- Proximity to transmission and transportation decrease disturbance and transmission costs.
- It would appear that existing roads or transmission access and maintenance roads could be utilized instead of the proposed new road shown on Figure 11.4.1.1-1 to avoid unnecessary disturbance, fragmentation and destruction of native wildlands.
- Given the very limited water resources available in this area, and pending a revised baseline analysis by BLM, it appears that BLM may need to scale back the peak construction year and full build-out scenarios and ensure that any water use follows the standards set out in Section III.

vi. Corrections

Although there is an existing 69-kV transmission line passing through the SEZ, the SWIP line, now under construction will add capacity to 500 kV in its first phase of development.

The BLM will be issuing a Notice of Intent for Wilson/Table Mountain Wild project before the Final Solar EIS is complete. This project if completed is within 50 miles of the Delamar Valley and should be added to the cumulative effects table of other renewable energy projects.

The DPEIS fails to list as Special Status Species within the 50 mile SEZ region the following: Hiko White River springfish, White River springfish, Pahranagat roundtail chub, Moapa dace, Virgin River chub, woundfin and Southwest willow flycatcher, Moapa pebblesnail, grated tryonia, Pahranagat pebblesnail, Hubbs pyrg, Flag springsnail, and Blue Point springsnail, Pahranagat dace, Meadow Valley speckled dace and the Meadow Valley Wash desert sucker.

D. Dry Lake SEZ

i. Overview

The proposed Dry Lake SEZ is located in Clark County in southern Nevada. The SEZ has a total area of 15,649 acres. The proposed Dry Lake SEZ is in an undeveloped rural area that has seen impacts from the nearby city of Las Vegas. The SEZ is located in Dry Lake Valley and is bounded on the west by the Arrow Canyon Range and on the southeast by the Dry Lake Range. The Las Vegas Valley is located approximately 10 miles south. The towns of Moapa and Overton are as close as 18 miles northeast and 23 miles east of the SEZ, respectively. The Nellis Air Force Base is located approximately 13 miles southwest of the SEZ. The nearest major roads accessing the proposed Dry Lake SEZ are I-15, which passes through the southeastern portion of the SEZ, and U.S. 93, which runs from northwest to southeast along part of the southwest border of the SEZ. Three designated transmission corridors that are heavily developed with numerous natural gas, petroleum products, and electric transmission lines (including a 500-kV transmission line) pass through the proposed SEZ. It is assumed that the existing 500-kV transmission line, or any of the other existing transmission lines, could potentially provide access from the SEZ to the transmission grid.

The SEZ lies within the Northeastern Recovery Unit for the desert tortoise and partially covers occupied habitat.

There are four foreseeable and sixteen pending solar development applications and one foreseeable and nine pending wind site testing applications within a 50-mile radius of the proposed Dry Lake SEZ. Five of the 16 pending solar applications are either within or adjacent to the SEZ, as is one of the wind site testing applications.

While aspects of this proposed SEZ have significant environmental concerns associated with them, we believe that with proper siting and design an appropriate SEZ can be designated, and provided the BLM addresses the concerns raised in our comments, we support the designation of our recommended area as a Solar Energy Zone.

ii. Overarching issues for this SEZ

The overarching issues highlighted below should be addressed by the BLM in the Final PEIS and in analysis for individual projects proposed within the SEZ.

- **Cumulative impacts**

Due to the number of cumulative effects from renewable energy projects, transmission, and the Apex Industrial area to the south, there are significant cumulative impacts in the region. However, given the proximity of a large urban area and existing transportation and transmission infrastructure, we believe that with some boundary adjustments, this is a good location for a SEZ.

iii. Recommended boundary adjustments

As currently drawn, the SEZ includes some areas that are not appropriate for designation as a SEZ, including state mapped bighorn sheep wildlife movement corridors. We ask the BLM to revise the boundary of the SEZ as indicated in the included map for the Dry Lake area (Fig. 3).

Our boundary adjustments would exclude the Dry Lake playa to assure that this ephemeral wetland is maintained for its hydrologic value. Further, the series of rugged and jumbled washes flowing southwest to northeast into the playa, near the SEZ's north boundary, would be excluded to retain the inflow of water from the Arrow Canyon Range and as potential wildlife movement corridors. Additionally, the original SEZ boundary includes an area that is heavily developed with existing transmission lines and a mineral plant along the Interstate in the SEZ's southeast corner. These already developed areas should not be considered available for solar development. Further, as currently drawn, the SEZ could impact a National Register-listed site associated with the Old Spanish NHT, and the SEZ comes close to the trail itself. Our recommended boundary changes would avoid impacts to these sites. We also extend the site to the northeast and bring it to the border of the Moapa tribal lands that would create opportunities for tying into potential solar projects on their lands.

As currently drawn, the southeastern portion of the SEZ encompasses a National Register-listed site associated with the Old Spanish NHT and comes close to the trail itself. We recommend that the BLM move the southeastern boundary of the SEZ to the west of I-15 to help reduce impacts to the trail and associated sites.

iv. Sensitive natural resources and recommended additional impacts analysis

The sensitive resources highlighted below require special attention and additional analysis in the BLM's Final PEIS and in analysis for individual projects proposed within the SEZ.

- **Species of concern**

Potentially suitable habitat for 62 special status species occurs in the affected area of the Dry Lake SEZ. For all of these special status species, less than 1% of the potentially suitable habitat in the region occurs in the area of direct effects. There are 13 groundwater dependent species that occur outside of the areas of direct and indirect effects. Potential impacts on these species could range from small to large depending on the solar energy technology deployed, the scale of development within the SEZ, and the cumulative rate of groundwater withdrawals.

More than 25 reptile species occur within the area that encompasses the proposed Dry Lake SEZ. The desert tortoise is a federal and state listed threatened species. This SEZ has desert tortoise and rosy two-tone beardtongue from the NNHP data. Several intersections occur with NDOW mapped movement corridors for desert bighorn sheep, but wildlife corridors are supposed to be excluded in SEZ designation. Adjustments should be made to exclude those corridors. The NDOW data shows the presence of the banded Gila monster, common chuckwalla, desert horned lizard, desert night lizard, LeConte's thrasher, longnosed leopard lizard, sage sparrow and western banded gecko. The proximity to Las Vegas and existing transmission development in the area make this one of the more heavily inventoried SEZs in Nevada; it also makes this an area that has seen impacts from exurban activities that are damaging to the quality of wildlife habitats (an example of cumulative impacts). Because rocky outcrops are high-quality habitat for many of the lizard species of conservation concern and because solar energy construction may require the removal these large boulders, we recommend the BLM explicitly exclude rock outcrops from the SEZ. The area also shows high biodiversity potential, typical of much of the Mojave Desert. Our proposed boundary change addresses these species concerns in the southern portion of this SEZ and will minimize impacts to wildlife habitat.

- **Groundwater availability to support development**

The DPEIS fails to fully appreciate the limits on groundwater availability in the Garnet groundwater basin underlying this SEZ. The perennial yield for this basin is estimated at 400 afy; both permitted water rights (approximately 3,400 afy) and current use (797 to 1,558 afy) exceed the perennial yield. In 2002, the State Engineer issued Order 1169 stating that new applications for water in the carbonate-rock aquifer systems within Garnet Valley (and surrounding basins) would be suspended to allow further study of the system. The water needs for existing cooling technologies exceed the perennial yield – we agree that currently wet and dry-cooled technologies are not feasible in this basin. Unless and until cooling technologies and

associated water use requirements change, it appears that only non-cooled technologies requiring 71 to 711 afy would likely be feasible. [10]

BLM's feasibility analysis, however, glosses over the large amount of water needed during construction – up to six to eight times the perennial yield – in a peak construction year. *See* DPEIS 11.3-59 ("The availability of groundwater, groundwater rights, and the impacts of groundwater withdrawal would need to be assessed during the site characterization phase of a solar development project."). The DPEIS does not take a critical look at whether there is enough water to construct and then operate a given solar project. BLM must revise its analysis, scale back the peak construction year and full build out scenarios to a level commensurate with the available water supply, and ensure that any water use follows the recommendations in Section III above.

In the FPEIS, the BLM should conduct a critical analysis of the water availability situation in the Garnet Valley basin and disclose it to decision makers, developers and the interested public. Groundwater withdrawal impacts should be measured, such as requiring piezometers in test wells, and measuring phreatophyte die-off for the Dry Lake Valley.

v. Opportunities for environmentally responsible development

The BLM can limit impacts and maximize benefits from solar energy development on this SEZ by following the recommendations below.

- With a boundary adjustment discussed below, avoidance of Bighorn sheep and reptiles species can be accomplished.
- Avoidance of the playa wetlands of Dry Lake will limit impacts to species there.
- Proximity to transmission, transportation and a large metropolitan area decrease disturbance and transmission costs.
- Given the very limited water resources available in this area, it appears that BLM may need to scale back the peak construction year and full build-out scenarios and ensure that any water use follows the design features and recommendations set out in Section III.

vi. Corrections

[10] The BLM and the FPEIS should consider the implications of the Nevada State Engineer's permitting of water use for dry-cooled power plants rather than wet-cooled plants, because the plants were to use "water efficient, air-cooled technology" for "realistic power generation projects." State Engineer Ruling No. 5008 (March 20, 2001) at p.24-25, 40, available at http://images.water.nv.gov/images/rulings/5008r.pdf. A year later, in a neighboring basin, the Nevada State Engineer considered water rights applications for which a potential use was a water-cooled power plant. However, as the State Engineer recognized, "Technology is available, which can produce significant amounts of electricity using air-cooled systems. This technology uses significantly less quantities of water. … The State Engineer … does not believe it is prudent to use substantial quantities of newly appropriated ground water for water-cooled power plants in one of the driest places in the nation, particularly with the uncertainty as to what quantity of water is available from the resource, if any." State Engineer Ruling No. 5115 (April 18, 2002) at p.25, available at http://images.water.nv.gov/images/rulings/5115r.pdf.

The DPEIS fails to mention or include in its effects analysis the K Road Moapa proposed solar project. This project is located on tribal lands of the Moapa Band of Paiute Indians, and is immediately north of the Dry Lake SEZ. It is envisioned to be a photovoltaic field 2,000 acres in size and would provide up to 350 MV of energy. Some of the concerns that should be addressed are cumulative impacts to desert tortoise and other species, groundwater availability and coordination of projects to minimize impacts.

E. East Mormon Mountain SEZ

i. Overview

The East Mormon Mountain SEZ straddles Toquop Wash just to the east of East Mormon Mountain; it is just north of the Clark and Lincoln County border. The SEZ borders the Mormon Mountain Wilderness Area. The locale is currently pristine and remote with poor access. No other renewable energy projects are in immediate proximity to this site. The area was previously identified as a site for a coal-fired power plant. The SEZ is located in the Tule Desert groundwater basin of the Lower Virgin River basin, the flows from which terminate at the Virgin River and at major regional carbonate springs in Lake Mead National Recreation Area. Soil wind erosion potential is moderate. The SEZ immediately borders both the Mormon Mesa and Beaver Dam Slope desert tortoise critical habitat areas, and itself is of high habitat suitability.

Overall, the area does not have major conflicts, and provided the BLM addresses the concerns below, we support the designation of this area as a Solar Energy Zone.

ii. Overarching issues for this SEZ

The overarching issues highlighted below should be addressed by the BLM in the Final PEIS and in analysis for individual projects proposed within the SEZ.

It is likely that the SEZ, due to its unburned status, provides better habitat for desert tortoise than adjacent burned areas that are currently designated as critical habitat. Consultation with the U.S. Fish and Wildlife Service for desert tortoise should include consideration of whether it would confer more protection to the species to shift the location of the SEZ to this nearby burned area, re-designating the current proposed SEZ site as replacement critical habitat.

iii. Recommended boundary adjustments

None noted.

iv. Sensitive natural resources and recommended additional impacts analysis

The sensitive resources highlighted below require special attention and additional analysis in the BLM's Final PEIS and in analysis for individual projects proposed within the SEZ.

- **Availability of groundwater to support development**

The DPEIS fails to fully appreciate the limits on groundwater availability in the Lower Virgin River Valley groundwater basin underlying this SEZ. The perennial yield for this basin is estimated at 3,600 afy; both permitted water rights (approximately 12,348 afy) and current use (7,460 afy) exceed the perennial yield. The area is also closed to new appropriations of surface water. The Tule Desert Hydrographic Basin is even more restricted, with State Engineer Order 5181 setting the perennial yield at 2,100 afy pending further study. Also with respect to groundwater availability, it must be noted that there are already applications filed for 185,000 afy by other interests.

Given that the basin is over-appropriated and overused, it seems likely that only non-cooled or limited dry-cooled projects would be feasible in this area, unless significant changes to cooling technologies and associated water requirements are made and assuming all water used could be acquired from existing water rights holders. While ruling out wet-cooling technologies, DPEIS 11.5-61, the DPEIS leaves the door open for dry-cooled technologies which would need 567 to 2,172 afy for 80% buildout and non-cooled technologies requiring 41 to 408 afy for 80% buildout would seem to be likely feasible.

BLM similarly glosses over the large amount of water needed during construction – almost half of the perennial yield – in a peak construction year. The DPEIS does not take a critical look at whether there is enough water to construct and then operate a given solar project. In the FPEIS, the BLM must revise its analysis, scale back the peak construction year and full build-out scenarios to a level commensurate with the available water supply and ensure that any water use follows the design features and recommendations in Section III above.

- **Impacts on desert tortoise**

The East Mormon Mountain SEZ lies in the Northeastern Mojave Recovery Unit and directly borders both the Mormon Mesa and Beaver Dam Slopes critical habitat units (USFWS 2008). These units were severely impacted by wildfires in 2005 and, where burned, offer only marginal quality habitat. The location of the SEZ is unburned and considered highly suited for tortoises. If developed, the SEZ would no longer provide tortoise habitat.

Aside from the direct impacts of the SEZ on tortoise habitat, the proposed access road is also of concern. This road, leading north from I-15, bisects high quality desert tortoise habitat in the Mormon Mesa critical habitat unit, destroying and fragmenting habitat and increasing the risk of injury or death to tortoises from direct and indirect mortality. The BLM should include analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts.

- **Impacts on rare desert plants**

The gypsum-rich soils found along Toquop Wash provide specialized habitats for rare desert plants. The Las Vegas buckwheat and three-cornered milkvetch are two which are included in Table 11.5.12.1-1 that lists plants that may be found in the vicinity of the SEZ. A third that does

not appear in the table is sticky ringstem. Sticky ringstem is a gypsophile that is known from populations in northeastern Clark County, including one from nearby Moapa, Nevada.

The Las Vegas buckwheat is a species found to be warranted for listing under the Endangered Species Act but precluded by higher priority species. The other two species are BLM special status species and are also "Covered Species" in the Clark County Multiple Species Habitat Conservation Plan. In 2007, Clark County commissioned a report on the status of low elevation rare plants which included the sticky ringstem and three-cornered milkvetch (TNC 2007). In that report, the sticky ringstem was given a "high" overall threat rank and the three-cornered milkvetch a "very high" ranking.

Land clearing and grading, both for the site and the roadway, would destroy any plants and habitats in the affected area, thereby increasing their local extirpation and overall risk for extinction. The BLM should include analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts.

- **Destruction of surface hydrologic function**

As noted in the DPEIS, the East Mormon Mountain SEZ is located on an extensive alluvial fan, containing many ephemeral drainages and two major incised washes. Several million cubic meters of runoff is conveyed through the system annually.

The clearing and grading associated with solar development of this site could effectively destroy the current ecological and hydrologic function of the Toquop Wash watershed – not just on the site but above and below the site as well.

Desert washes such as those found on the SEZ are well known to provide important habitat for wildlife, including desert tortoises that often burrow into the caliche caves associated with the washes. Other wildlife use washes as travel routes across their territories.

Rare plant surveys for the species mentioned below should be conducted with the intent of identifying areas with suitable soil and conditions to support these species. Proactive avoidance of these areas is the best strategy.

As suggested in the DPEIS, the BLM should not develop in Toquop or South Fork Toquop Washes. Other major ephemeral washes within the SEZ should also be excluded from disturbance. This will preserve ecologic and hydrologic function, protecting desert tortoises and other wildlife and rare plant species while minimizing development costs related to grading and hydrology.

v. Opportunities for environmentally responsible development

The BLM can limit impacts and maximize benefits from solar energy development on this SEZ by following the recommendations below.

- The BLM should require that any developer construct the proposed new access road with designed wildlife underpasses and tortoise exclusionary fencing along the right-of-way boundary. Development in East Mormon Mountain should be used as a means to develop more effective mitigation for tortoise mortality.

- There is the opportunity for the BLM to require offsite mitigation from the developer to benefit desert tortoises, rare plants and other special status species found in the SEZ.

- There is the opportunity for the BLM to coordinate the needs for transmission of the East Mormon Mountain SEZ in the analysis and design of the TransWest Express transmission line proposal.

- Given the very limited water resources available in this area and because the aquifer is in a state of overdraft, it appears that BLM may need to scale back the peak construction year and full build-out scenarios and ensure that any water use follows the design features and recommendations made in Section III.

vi. Corrections

- Sticky ringstem (*Anulocaulis leiosolenus var lesiosolenus*) should be added to the list of rare plants that may occur in the project area and that should be included in any rare plant surveys.

- The DPEIS characterizes the SEZ as being in the Lower Virgin River groundwater basin; while correct at a large, landscape-scale, it is more precise to state that the SEZ is in the Tule Desert groundwater basin.

- The DPEIS is mute with regards to the development of the nearby lands conveyed to private ownership in the Lincoln County Lands Act. This development should be considered in the cumulative impacts analysis, particularly with reference to groundwater availability and impacts to desert tortoises.

F. Millers SEZ

i. Overview

Millers SEZ is located north of U.S. 95/U.S. 6, which runs east–west along its southern border. The SEZ is in the southeast end of the Big Smoky Valley, in an area known as Tonopah Flat, and is surrounded by Lone Mountain to the south, the Monte Cristo Range to the west, and the San Antonio Mountains to the east. Three intermittent streams run into Millers SEZ: Ione Wash, Peavine Creek, and an unnamed wash. Slime Wash is also close, ending 3 miles east of the SEZ. Several springs also occur in the vicinity of Millers SEZ. Wetlands in Millers SEZ exist along the southern and southwestern border. Floodplains have not been mapped for Millers SEZ and vicinity, but aerial surveys suggest that 2000 acres (12%) of the total SEZ area may be in a 100 year floodplain.

The SEZ lies in the Tonopah Flat groundwater basin, which is designated as over-appropriated by the State Engineer. This is a designated basin according to NDWR Orders 725 and 827; municipal and domestic water are the preferred beneficial uses.[11]

One solar project in the immediate area has been approved: the Crescent Dunes project is located 3 miles northeast. There is also a pending application (NVN 086548) 19.5 miles southeast and several closed applications north and south of the SEZ, all indicating a fairly strong interest in developing this area for solar power despite water limitations. **Overall, the area does not have major conflicts, and provided the BLM addresses the concerns below, we support the designation of this area as a Solar Energy Zone.**

ii. Overarching issues for this SEZ

The overarching issues highlighted below should be addressed by the BLM in the Final PEIS and in analysis for individual projects proposed within the SEZ.

- **Cumulative effects**

Sand dunes exist to the southwest and northeast of the SEZ, and depending on how and where build-out of Millers SEZ occurs it could affect sand transport between these areas, if sand transport is occurring. Vegetation communities in and around Millers SEZ associated with playa washes, greasewood flats, or other intermittently flooded areas that are downgradient from solar development could also be affected by widespread ground disturbance. The Tecopa bird's-beak is an imperiled plant found in alkali meadows and is down hydrologic gradient from the proposed SEZ and could be impacted by groundwater withdrawals and/or changes to surface hydrology. The BLM should include analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts.

iii. Recommended boundary adjustments

Insufficient information is available about the locations of sensitive areas within the SEZ to suggest adjustments; avoidance would likely need to occur at the project level after project-specific surveys are completed (unless additional surveys are performed by BLM prior to SEZ development).

iv. Sensitive natural resources and recommended additional impacts analysis

The sensitive resources highlighted below require special attention and additional analysis in the BLM's Final PEIS and in analysis for individual projects proposed within the SEZ.

- **Special status species and other species of concern**

[11] http://images.water.nv.gov/images/orders/725o.pdf ; and,
http://images.water.nv.gov/images/orders/725o.pdf

Candelaria blazingstar could occur within Millers SEZ (it is known to occur east of the SEZ) and might be affected by project development; clearance surveys for this species would be required. USFWS coordination would be required for two federal candidate species: Crescent Dunes aegialian scarab beetle and Crescent Dunes serican scarab beetle. Although these two species do not have habitat onsite, they could experience cumulative impacts from SEZ development and associated disruption of sand transport systems between unstabilized dunes offsite (this could also affect Nevada dune beardtongue, a BLM sensitive plant). The stabilized dune habitat that does exist within the SEZ provides habitat for small mammal and invertebrate species as well, and should be avoided when siting projects. The Tecopa bird's-beak is a special status species known from only ten locations in California and Nevada. Its habitat is alkali meadows, and it is considered to be "globally imperiled". It is found down hydrologic gradient from the proposed SEZ. Wong's pyrig is a springsnail, also considered to be "globally imperiled," that occurs down hydrologic gradient from the SEZ. Nelson's bighorn sheep could use the valley to migrate between habitats, and this could also be compromised if large areas were developed. Avoidance of direct and indirect impacts to all these species must be addressed adequately at the project-specific level.

- **Millers Rest Stop**

This area is important as a spring and fall migration stopover site for a range of bird species due to the availability of water and non-native vegetation. It is likely that avoidance of this vicinity when siting projects would be sufficient to mitigate impacts; careful consideration of the appropriate buffer distance to avoid of impacts to avian species is needed.

- **Groundwater availability to support development**

The DPEIS fails to fully appreciate the limits on groundwater availability in the Tonopah Flat Basin underlying this SEZ. The perennial yield for this basin is estimated at 6,000 afy; permitted water rights (approximately 19,588 afy) exceed perennial yield and the current rate of groundwater pumping is unknown. Given the limited amount of water available in the basin, it seems likely that only dry-cooled or non-cooled projects may be feasible, and assuming all water used could be acquired from existing water rights holders. While ruling out wet-cooling technologies, the DPEIS leaves the door open for dry-cooled technologies which would need 1,067 to 4,067 afy for 80% buildout and non-cooled technologies requiring 77 to 763 afy for 80% buildout.

BLM also glosses over the large amount of water needed during construction – almost half of the perennial yield – in a peak construction year. The DPEIS does not take a critical look at whether there is enough water to construct and then operate a given solar project. In the FPEIS, the BLM must revise its analysis, scale back the peak construction year and full build-out scenarios to a level commensurate with the available water supply and ensure that any water use follows the design features and recommendations in Section III above.

- **Road configuration and soil**

Soils within the SEZ are also prone to rutting, and roads should be configured and developed to minimize impacts related to rutting and erosion.

v. Opportunities for environmentally responsible development

The BLM can limit impacts and maximize benefits from solar energy development on this SEZ by following the recommendations below.

- Avoidance of wash, playa, and stabilized dune habitats would minimize or eliminate impacts to amphibian, reptile, bird, and small mammal species, as well as to many cultural resources.

- Given the very limited water resources available in this area, it appears that BLM may need to scale back the peak construction year and full build-out scenarios and ensure that any water use follows the design features and recommendations made in Section III.

- Since this site is adjacent to U.S. 95/U.S. 6, access to the site would require minimal ground disturbance. Two transmission lines cross Millers SEZ, one N-S and one NW-SE. The latter is a locally designated corridor. A second locally designated corridor, which contains two existing lines, runs parallel to the SE boundary of the SEZ. There is also a designated Section 368 corridor ca. 15 miles SW. We do not currently have information on the availability of capacity on these existing lines, but even if they do not have the capacity to support additional generation, the possibility that they could be reconductored to augment their capacity while minimizing disturbance and permitting efforts is promising.

vi. Corrections

The Tecopa bird's-beakand Wong's pyrig are not listed as a Special Status Species in the DPEIS and should be included in Section 11.7.12.

G. Gold Point SEZ

i. Overview

The Gold Point SEZ, totaling an area of 4,810 acres (19 km2), is located in upper Lida Valley, a closed intermontane basin lying between MacGruder Mountain and Slate Ridge. The Gold Point SEZ is in the Lida Valley groundwater basin. While lying on the northwestern edge of the Death Valley Regional Flow System, Lida Valley basin has little carbonate rock so its recharge is basin-fill, almost totally from the precipitation in the surrounding mountains. The perennial yield of this groundwater basin is set at 350 acre feet/year, with usage rights totaling 76 acre feet/year.

The locale is currently pristine and remote from load centers, and a new transmission line would be needed to provide access from the SEZ to the transmission grid.

No other active renewable energy projects are in the immediate proximity to this site.

Overall, the area does not have major conflicts, and provided the BLM addresses the concerns below, we support the designation of this area as a Solar Energy Zone.

ii. Overarching issues for this SEZ

None noted.

iii. Recommended boundary adjustments

None noted.

iv. Sensitive natural resources and recommended additional impacts analysis

The sensitive resources highlighted below require special attention and additional analysis in the BLM's Final PEIS and in analysis for individual projects proposed within the SEZ.

- **Availability of groundwater to support solar development**

The perennial yield of Lida Basin is 350 afy. Water requirements for dust suppression and potable water supply during construction could be as high as 1,707 afy for the peak construction year. The total water use estimates for the peak construction year are on the order of 3 to 5 times greater than the perennial yield of the Lida Valley groundwater basin. Wet cooling is not feasible, and while water usage for dry cooling systems would be as high as 1,166 afy, about 3 times the perennial yield, BLM believes it to be feasible although it is "doubtful that a full build-out scenario using dry-cooling technologies could be supported with the available groundwater supplies." DPEIS 11.6-58.

BLM should revise its analysis to scale back the peak construction year and full build-out scenarios to a level commensurate with the available water supply and ensure that any water use follows the design features and recommendations in Section III above.

- **Surface Hydrology**

No studies have been undertaken in the area. The BLM should include in the FPEIS a study of the flood potential of the unnamed wash that bisects the SEZ. The BLM should also include analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts.

- **Pronghorn antelope**

A significant pronghorn antelope herd lives permanently in Lida Basin, and antelope are frequently seen on the proposed SEZ. Disturbance during dry seasons could interfere with antelope seeking scarce green foraging resources and spring areas. The BLM should include

analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts.

- **Unique Mojave-Great Basin transition zone**

Some of the northernmost Joshua trees inhabit Lida Basin, and this habitat should be preserved and not fragmented. As currently envisioned, the SEZ avoids the core Joshua Tree habitat area. This area is unstudied for rare plants and surveys should be thorough, covering more than one year and including both spring and late summer-fall surveys, as summer rains may account for species not detectable in spring.

- **Transmission corridor**

The assumed new transmission corridor would cross extremely dense Joshua tree woodland and scenic remote BLM areas used for hiking, camping, and other recreational activities, as well as potentially impact the historic mining town of Goldfield. The BLM should include analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts.

v. Opportunities for environmentally responsible development

The BLM can limit impacts and maximize benefits from solar energy development on this SEZ by following the recommendations below.

- There seems to be an opportunity to run the needed transmission line along highways 266 and 95, thereby sparing the bisection and fragmentation of desert habitats along the proposed route.
- The project design could take into considerations to provide antelope access to forage and water, and construction schedules outside the dry periods when antelope access is most critical.
- Given the very limited water resources available in this area, it appears that BLM may need to scale back the peak construction year and full build-out scenarios and ensure that any water use follows the design features and recommendations made in Section III.

vi. Corrections

- Add Great Basin spadefoot (*Scaphiopus intermontanus*) and Pacific rattlesnake (*Crotalus viridis lutosus*) as potential species occurring in SEZ area.

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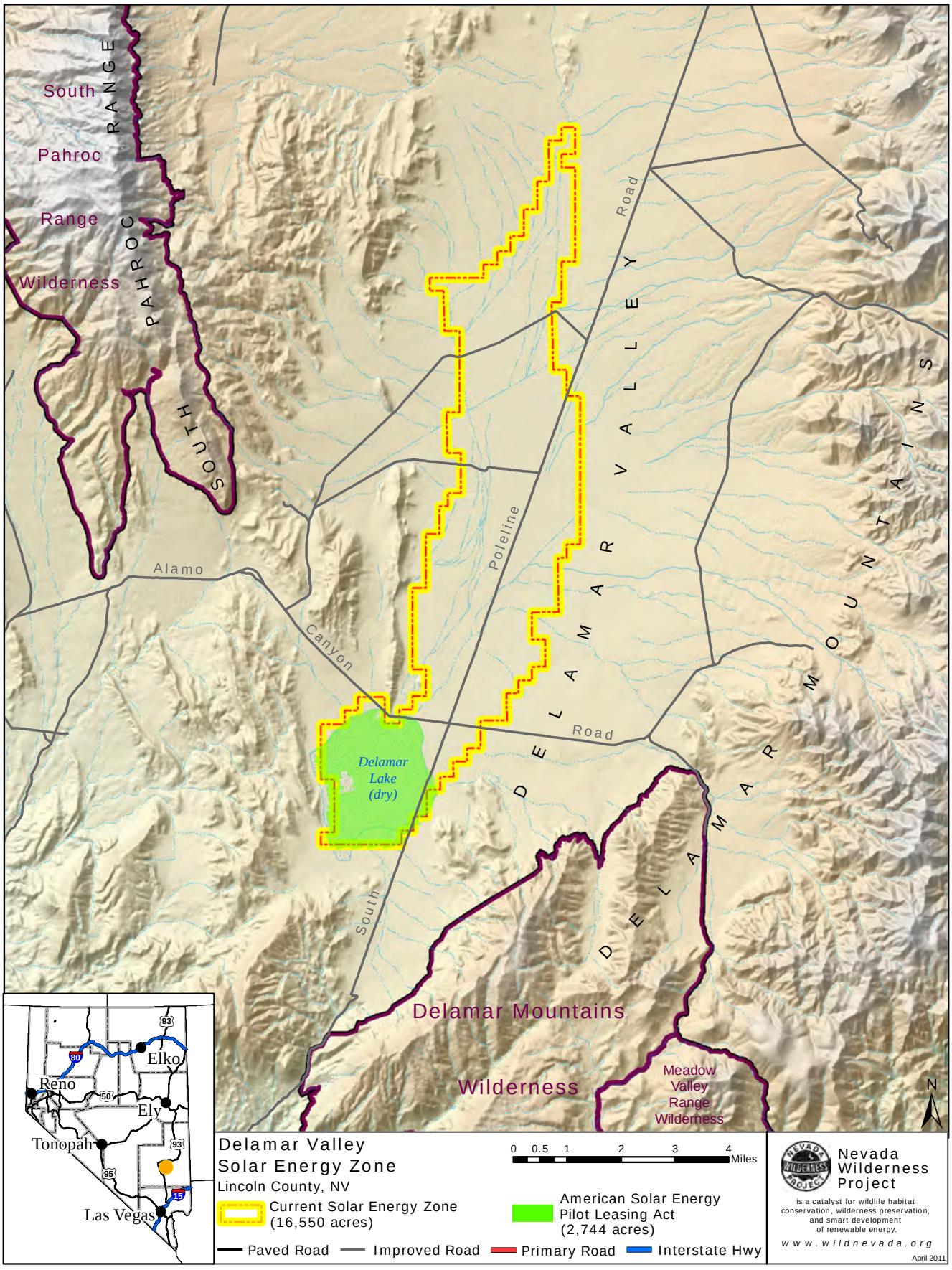

Figure 1. Delamar Valley Solar Energy Zone recommended boundary adjustments.

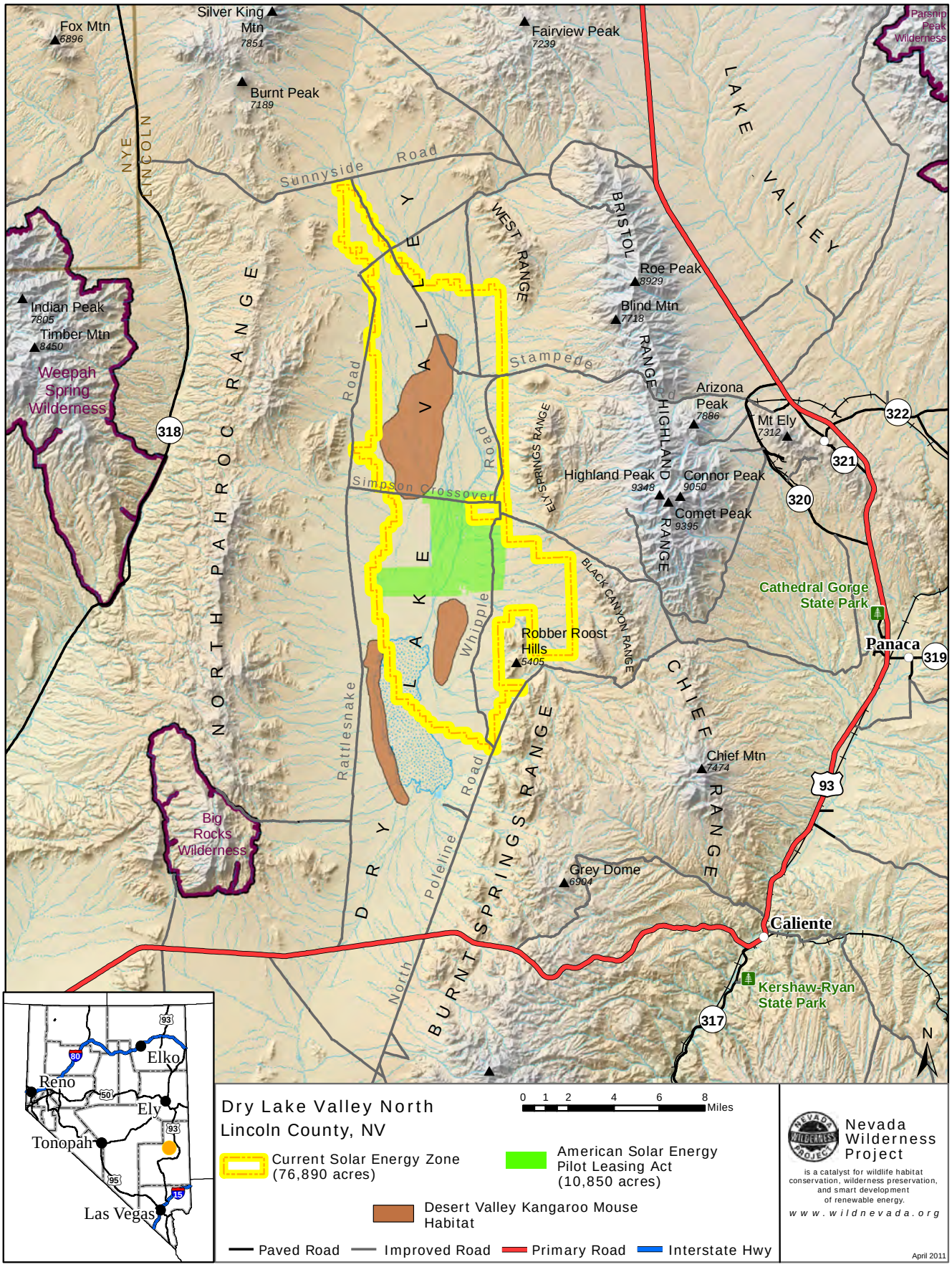

Figure 2. Dry Lake Valley North Solar Energy Zone recommended boundary adjustments.

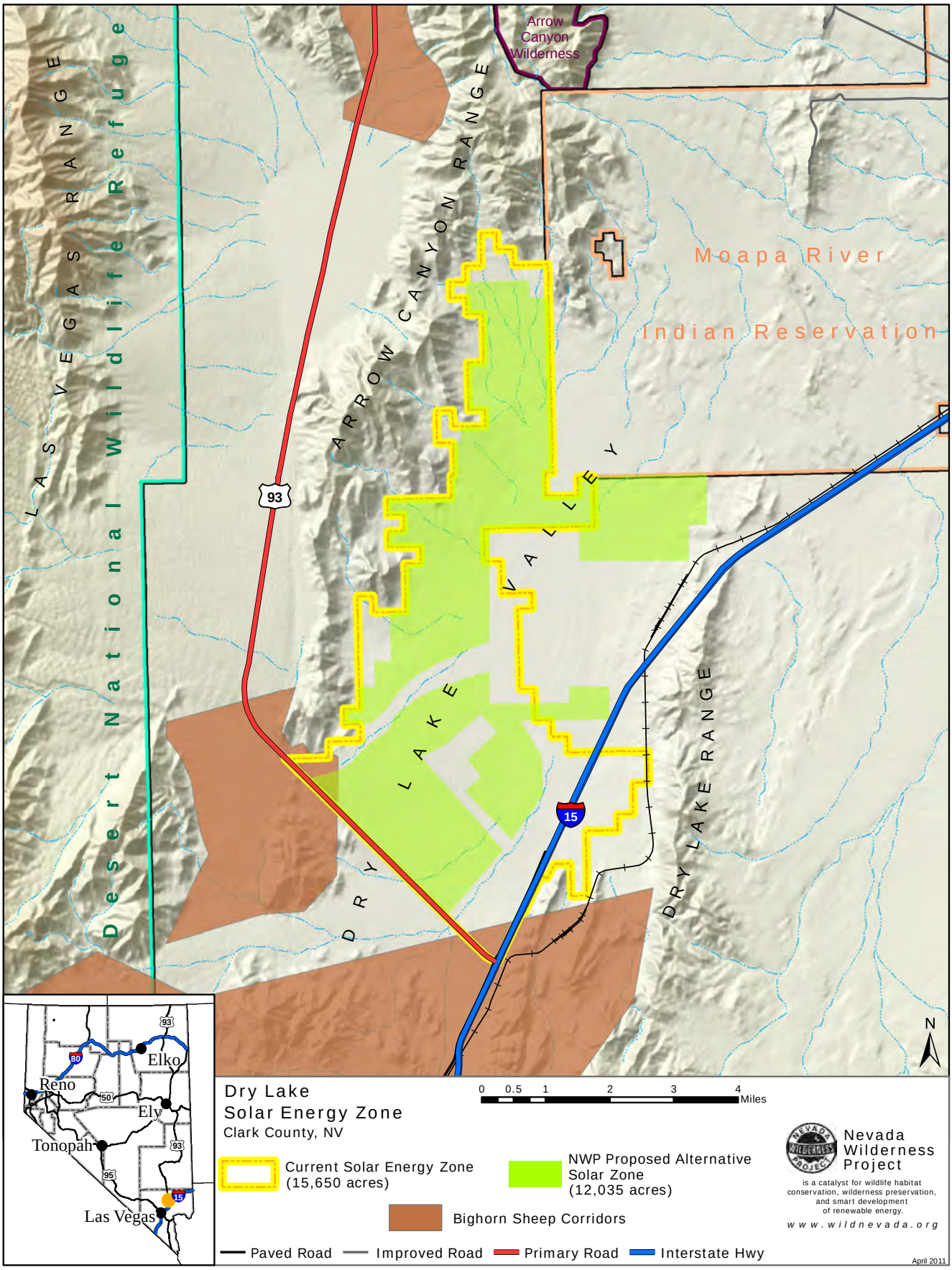

Figure 3. Dry Lake Solar Energy Zone recommended boundary adjustments.

Thank you for your comment, Siobhan McIntyre.

The comment tracking number that has been assigned to your comment is SolarD11790.

Comment Date: April 30, 2011 11:32:38AM
Solar Energy Development PEIS
Comment ID: SolarD11790

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May 1, 2011

Re: Draft Solar PEIS

To whom it may concern:

Please accept these comments on the Draft Solar Programmatic Environmental Impact Statement (Solar PEIS). I am a JD Candidate at Vermont Law School in South Royalton, Vermont and have been conducting research regarding solar development projects on public lands, originally undertaken in conjunction with seminar coursework, taught in the Fall of 2010 by Professor Timothy P. Duane.[1]

My research for this course aimed to compare and contrast impacts proposed in the Solar PEIS and selected, individual fast-track projects. To this end, I reviewed both the Draft Solar PEIS and individual draft or final Environmental Impact Statements (EIS) from three fast-track projects located within the Solar PEIS six-state study area: the Silver State Solar Project authorized for development on United States Bureau of Land Management (BLM) lands in southeast Nevada; the Sonoran Solar Energy Project proposed for development on BLM lands in central Arizona; and the Ivanpah Solar Electric Generation System Project proposed for development on BLM lands in southeastern California. In specific, I focused my comparison on water resource issues and socioeconomic factors, in light of the scarcity of water resources in the six-study area's particular climate and the national urgency in job creation, particularly the increasing interest in the "green jobs" sector. I reviewed Land Use Management Plans/Resource Management Plans from each BLM planning region impacted and reviewed state statutes and regulations that govern permitting utility facilities and water resource allocation in each of the three states. Furthermore, I reviewed language within these sources, as well as language within the Federal Land Policy and Management Act (FLPMA), the National Environmental Policy Act (NEPA), Right-of-Way (ROW) regulations, and the Council on Environmental Quality (CEQ)

[1] Associate Professor of Environmental Studies, University of California, Santa Cruz and Associate Professor of Law, Vermont Law School; Email: tpduane@ucsc.edu.

EIS regulations that dictates or provides guidance on agency to agency communication and collaboration.

Informed by this research and comparisons, the following comments aim to, first, provide my impressions of the potential benefits that the Solar PEIS may offer when incorporating national renewable energy initiatives into public lands management. Second, these comments present areas, specifically in regards to water resources, regional employment, and state and federal coordination, in which the Draft Solar PEIS currently falls short as a guidance document.

I. The Solar PEIS is a Starting Point for Future Solar Development on BLM Lands

The Solar PEIS will serve as a useful reference point and strong source of preliminary, centralized guidance for utility scale solar development on BLM lands in the desert southwest. This overarching document will provide a needed baseline for agency efforts to manage its multiple-use mandate and its task to balance development and conservation. This benefit is evidenced by comparing the three fast-track projects reviewed in my research and the administrative polices, design features, and mitigation measures recommended and mandated by the SEDP and SEZ programs outlined in the Solar PEIS.

A. The Solar PEIS: The Benefits of Regional BLM Multi-Use Guidelines

Most importantly, the Solar PEIS provides an essential geographic overview of the BLM's proposed six-state study area. This document offers a perspective of the regional landscape as a greater whole and provides undeniable land use planning benefits, which may fail to materialize from individual project EIS. In this manner, the Solar PEIS provides a centralized source of baseline environmental data for the region. This culmination of data presents BLM, the public, and developers with an opportunity to assess potential adverse impacts beyond the borders of specific projects, to brainstorm wide-ranging mitigation measures, and to anticipate and plan for environmental and legal restrictions that extend beyond site-specific or state-specific borders. For example, Solar PEIS analyses include information regarding "drought conditions, which have occurred in the six states since early 2000," and provides information and mitigation measures for interstate legal paradigms, including "water right[s] issues and various interstate compacts."[2]

The Solar PEIS confronts the tension between the national, state and regional interests in rapidly developing renewable energy technology and BLM's mandate to conserve environmental resources. The PEIS sets forth a national policy regarding how BLM should balance these tensions. For example, the Solar PEIS clarifies that conflicts between optimizing MWhs and renewable energy initiatives and conserving water resources, water resource conservation should take precedence, even when not so mandated by state water statutes and regulations.[3] Although, currently, "water management by the majority of solar developers is largely focused on securing access to greater supplies of water rather then looking at more water-efficient ways to produce

[2] U.S. BUREAU OF LAND MGMT., DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES 4-59 (2010)(*hereinafter* DRAFT SOLAR PEIS).
[3] *See e.g. id.*, 8.1-64, 8.2-64, 8.3-63, 9.1-68, 9.2-70, 9.3-69, 9.4-78, 11.1-67, 11.2-67, 11.3-63, 11.4-69, 11.5-64, 11.6-60, 11.7-57. (finding wet-cooling technology infeasible in all SEZ regions in Nevada, Arizona, and California, although wet-cooling options provide for the most MWhs).

energy," the Solar PEIS clarifies for BLM that projects proposed on BLM lands should reflect efforts to obtain water conservation *before* obtaining greater access.[4] This guidance is specified in Solar Energy Development Program (SEDP) water resource mitigation measures and objectives, including the requirement "to promote the sustainable use of water resources through appropriate technology selection and conservation practices" and the prohibition against facilities that would "contribute to the significant long-term decline of groundwater levels or surface water flows and volumes."[5] For areas where states do not impose legal restrictions or conditions on groundwater withdrawals, these mandates, including the prohibition on wet-cooling technology in all Solar Energy Zones (SEZ) in Nevada, Arizona, and California provide guidance on how BLM should balance its multi-use mission on federal lands, while providing an additional conservation benefit to the state.[6]

B. Proposed Improvements to the Solar PEIS

Although a regional guidance document that provides centralized information regarding national policies and guidelines for a federal, nationally promoted efforts offers, at a minimum, the above mentioned benefits, the Solar PEIS fails to live up to its potential to approach land use issues in a proactive and innovative manner. The following sections provide examples of some actions and research BLM should consider in order to address potential impacts, conflicts, and tensions that arise from utility scale solar development.

1. Water Resources

The Solar PEIS fails to draw on conservation measures already mandated and implemented by statute or regulation in states within the six-state study area. For example, in Arizona, statutes permit the Arizona Department of Water Resources (ADWR) director to require the use of effluent for industrial project water needs, if effluent is available at comparable cost to groundwater.[7] Likewise, at least one recently approved, fast-track solar project also employs this water conservation technique to ensure that project water needs do not threaten water resource preservation.[8] To authorize the current fast-track Silver State Solar Project on BLM lands in Nevada, the Nevada Division of Water Resources (NDWR) requested that Nevada BLM require the developer, NextLight to recharge groundwater with effluent from a nearby correctional facility, if the project compromises basin needs.[9] The Solar PEIS does not consider the use of effluent to meet water use or recharge needs for solar projects. BLM should consider this conservation alternative as one of a myriad options to address the tension between solar facility development and water resource conservation. Furthermore, when considering how to balance competing interests, the BLM should thoroughly research state and local law, as well as

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[4] Melissa Lamberton, David Newman, Susanna Eden, & Joe Gelt, *The Water-Energy Nexus*, ARROYO, 2010, at 7; *see e.g. id.*
[5] DRAFT SOLAR PEIS, *supra* note 2, at A-54, app. A.
[6] *Id.* at 8.1-64, 8.2-64, 8.3-63, 9.1-68, 9.2-70, 9.3-69, 9.4-78, 11.1-67, 11.2-67, 11.3-63, 11.4-69, 11.5-64, 11.6-60, 11.7-57.
[7] ARIZ. REV. STAT. ANN. § 45-515A.
[8] S. NEV. DIST. BUREAU OF LAND MGMT., SILVER STATE SOLAR PROJECT EIS 4-26 (2010).
[9] *Id.*

previous federal, state or private solar siting efforts, for previously enacted, successful mitigation measures that help balance these competing interests.

2. Green Jobs: Labor and Employment

The Solar PEIS provides an excellent opportunity for workers, governments, and communities to contemplate the labor practices and policies that should be considered when executing renewable energy development. The Draft Solar PEIS falls short of facilitating this opportunity. DOI's statutory authority for developing solar projects on public lands, the Energy Policy Act of 2005, states that the Act's central purpose is "to ensure jobs for our future with secure, affordable, and reliable energy."[10] Likewise, the extension of Department of Energy (DOE) funding to utility solar development on BLM lands is authorized by the American Recovery and Reinvestment Act of 2009, which focuses on preservation of employment for the American workforce.[11] Public comments submitted regarding current fast-track projects also reflect this national goal. For example, public comments submitted regarding Nevada's Silver State Solar project and California's Ivanpah project emphasize a desire to see these efforts mature into plentiful and lucrative job opportunities.[12] Considering this emphasis on employment, the BLM should take pains to look for creative ways to leverage solar development's potential to ameliorate current unemployment rates. Furthermore, BLM should utilize the Solar PEIS as a means to mitigate potential problems arising from labor disagreements and to ensure that developers create high-end, well-paying jobs.

BLM's suggested mitigation measures to mandate community monitoring programs in socioeconomic Regions of Influence for solar projects and encouragement to developers to initiate community outreach programs provide a starting point for these efforts.[13] BLM should amend the Draft Solar PEIS by mandating these community outreach programs and requiring additional measures that address the quality, not just the quantity of labor generated by solar projects on federal lands. Consequently, BLM should provide more specific guidance regarding the implementation of these programs.

In addition, BLM should use the Solar PEIS as an opportunity to build a new body of information regarding the intersection of fair labor concerns and renewable energy development. For example, in the PEIS, BLM should provide a checklist of mandated factors that more specific, detailed review in project specific EIS must take into account. These factors would address labor standards and would include, at a minimum, potential unions in the area that may bid onto solar projects; any agreements between developers and labor contractors; any applicable Project Labor Agreements; and, state and federal laws such as the Bacon-Davis Act, which require employers to pay prevailing wages to workers employed on federally funded projects.[14] These factors are strikingly absent from the canon of socioeconomic factors that appear in project specific EIS. For example, public comments for the California Ivanpah project note that Brightsource's Engineering, Procurement and Construction Contractor execute an agreement

[10] Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005).
[11] American Reinvestment and Recovery Act of 2009, 42 U.S.C. § 16516(a) (2009).
[12] SILVER STATE SOLAR PROJECT EIS, *supra* note 8, at 0064, 0065, 0066, app. F; IVANPAH FEIS, *supra* note 449, at A.1-8, A.1-81, A.1-182, A.1-195.
[13] DRAFT SOLAR PEIS, *supra* note 2, at A-99, A-100, app. A.
[14] Bacon Davis Act, 40 U.S.C. § 3142.

with the California Building Trades Council "to ensure fair wages and benefits for workers who contribute to this project."[15] However, the Ivanpah Final EIS does not mention this agreement.

The Solar PEIS should also require BLM project specific EIS's to consider innovative techniques to solving fair labor and unemployment problems. For example, California SEZ areas reflect striking contrasts in local employment patterns.[16] While Riverside County and San Bernadino County experienced 13 percent unemployment following the 2009 recession, Yuma County, Arizona and Imperial County, CA experienced unemployment rates as high as 29 percent.[17] BLM should encourage project specific EIS to consider and recommend to developers innovative labor agreements such as those utilized by the Apollo Project in Los Angeles, which combats local unemployment by requiring publically funded projects to employ a certain percentage of workers from the area directly impacted by these projects.[18]

3. Resource Management Plan Amendments: The First Tier of Management

The RMP/LUP serves as the primary mechanism to ensure BLM acts according to the mission set forth in FLPMA: to balance multiple-use and conservation goals when managing public lands.[19] The difference in outcome between current fast-track projects demonstrates the important and influential impact of these legally binding guidance documents. For example, the water resource conservation ethos promoted by Nevada's Las Vegas Resource Management Plan (LVRMP) implements statements encouraging water conservation in the Silver State Solar Project; in contrast, Arizona's Lower Gila South Resource Management Plan (LGSRMP) provides no guidance towards water conservation and has led to a project that sacrifices this scarce resource.[20]

The Solar PEIS fails adequately to address the role of RMP/LUP in the planning process. BLM should emphasize the importance of, if not mandate, *full* and comprehensive updates of any RMP/LUP that does not currently provide for renewables development on public lands. The RMP/LUP is a holistic guidance document that should look towards the interactions of different uses across public lands. Therefore, BLM should seek to update RMP/LUP that address all foreseeable uses and mitigate other uses in such a way that is compatible and accounts for future solar developments.

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[15] NEEDLES FIELD OFFICE, CAL. BUREAU OF LAND MGMT., CAL. DESERT CONSERVATION AREA PLAN AMENDMENT/FINAL ENVTL. IMPACT STATEMENT FOR IVANPAH SOLAR ELECTRIC GENERATING SYSTEM A.1-182 (2010) [*hereinafter* IVANPAH FEIS].

[16] *See e.g.* DRAFT SOLAR PEIS, *supra* note 2, at 9.1-233, 9.3-269, 9.4-337.

[17] *Id.*

[18] *See* Benjamin S. Beach, *Using Government Policy to Create Middle Class Green Construction Careers*, 18 J.L. POL'Y 1, 7 (2009); *see also* http://apolloalliance.org/ (last visited 4/20/2011).

[19] LAND USE PLANNING HANDBOOK, *supra* note 103, at 1.

[20] *See* LAS VEGAS FIELD OFFICE, LAS VEGAS VALLEY RES. MGMT. PLAN 3-19 (1998); SILVER STATE SOLAR PROJECT EIS, *supra* note 8, at 4-26; PHOENIX DISTRICT OFFICE, ARIZ. BUREAU OF LAND MGMT., LOWER GILA S. RES. MGMT. PLAN (1985); ARIZ. BUREAU OF LAND MGMT., DRAFT ENVTL. IMPACT STATEMENT FOR THE PROPOSED SONORAN SOLAR ENERGY PROJECT, MARICOPA COUNTY 1-2 (2010) [*hereinafter* DEIS SSEP].

4. The Solar PEIS Should Mandate Increased Efforts Towards Inter-agency Coordination and Collaboration

FLPMA requires BLM to comply with applicable state laws when granting rights-of-way.[21] Furthermore, FLPMA encourages BLM to go beyond this bare minimum, to reach out, and to coordinate "to the fullest extent possible" with state and local governments when authorizing ROWs.[22] Although the Solar PEIS takes an encouraging step by mandating pre-application meetings with developers (otherwise only encouraged by FLPMA regulations), the Solar PEIS should mandate contact between BLM and other agencies or local governments that oversee implicated legal mandates regarding resource development. Furthermore, although the Solar PEIS encourages BLM to include other affected agencies in pre-application meetings, the Solar PEIS does not set up a specific protocol for establishing contact with these agencies.[23] A model practice could echo California Desert Conservation Area Plan (CDCAP) mandates requiring BLM to "participate to the maximum extent possible in State Energy Commission hearings on powerplants proposed for siting in the CDCA."[24] Likewise, similar to the California Energy Commission Memorandum of Understanding (MOU) [25] and the Renewable Energy Action Team (REAT) MOU[26] agreements, the Solar PEIS could encourage or mandate BLM to execute MOUs detailing agency specific responsibilities with affected state and local agencies when siting future solar facilities on BLM lands. This practice not only ensures that all voices and governing constituents are considered when developing projects, but also serves to streamline efforts to authorize projects. As previously mentioned, states also may devise innovative measures to address potential conflicts based on regional knowledge unavailable to a national agency. In developing the Draft Solar PEIS, it is surprising to find both Nevada's electric utility agency, Public Utilities Commission of Nevada (PUCN), and Arizona's Arizona Corporation Commission (ACC) absent from the coordinating agencies list.[27] Although BLM possesses sole jurisdiction to approve land uses on BLM lands, both state agencies oversee environmental standards or certificates, which must be met before utility developers may proceed with proposed projects.[28] Likewise, water resource managers in Nevada, Arizona, and California did not serve as participating agencies.[29] BLM should make all attempts possible to engage these groups and should outline a programmatic system to initiate this engagement (e.g., MOUs, formal notification requirements, or other methods). Without collaboration efforts,

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[21] 43 U.S.C. § 1765(a)(iii)-(iv).
[22] 43 C.F.R. § 2801.2.
[23] *See id.*
[24] CAL. DESERT DISTRICT, CAL. BUREAU OF LAND MGMT., THE CAL. DESERT CONSERVATION AREA PLAN, AS AMENDED 95 (1980) (reprint 1999).
[25] MEMORANDUM OF UNDERSTANDING BETWEEN THE U.S. DEPARTMENT OF INTERIOR, BUREAU OF LAND MANAGEMENT CALIFORNIA DESERT DISTRICT AND THE CALIFORNIA ENERGY COMMISSION STAFF 1, *available at* http://www.energy.ca.gov/siting/solar/BLM_CEC_MOU.PDF (*herinafter* CEC MOU).
[26] MEMORANDUM OF UNDERSTANDING BETWEEN THE CALIFORNIA DEPARTMENT OF FISH AND GAME, THE CALIFORNIA ENERGY COMMISSION, THE BUREAU OF LAND MANAGEMENT, AND THE U.S. FISH AND WILDLIFE SERVICE REGARDING THE ESTABLISHMENT OF THE CALIFORNIA RENEWABLE ENERGY ACTION TEAM ("REAT MOU"), November 17, 2008, *available at* http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/pa/energy.Par.76169.File.dat/RenewableEnergyMOU-CDFG-CEC-BLM-USFWS-Nov08.pdf (last visited April 26, 2011).
[27] DRAFT SOLAR PEIS, *supra* note 2, at 1-19, 20.
[28] NEV. REV. STAT. § 704.865; ARIZ. REV. STAT. ANN. § 40-360.02.
[29] DRAFT SOLAR PEIS, *supra* note 2, at 1-19, 20.

especially concerning water resource access, solar project development proposals may face a deadlock between state and federal authorities.

5. The Solar PEIS and SEZ-Specific Analyses Cannot Replace Project Specific EIS and Should Not Serve as a Rubber Stamp for Future Projects

The more specific the guidance for a particular project and the greater the direction provided towards navigating the legal mandates, political agreements, and policy concerns, the faster solar projects will be approved to meet the nation's current economic urgency and the better these projects will serve the community and the nation.

To this end, the BLM's SEZ alternative is the better choice for providing guidance for solar development on public lands compared to the SEDP (BLM's preferred alternative). The SEZ alternative limits development to areas with known environments and investigated affects. The conversations regarding the tensions between development and conservation in these areas has already begun and relationships have already been formed.

However, the SEZ alternative should not serve as a rubber stamp for future solar projects. BLM needs to take a close look at each project on a case-by-case basis and should attempt to apply innovative answers to regionally-specific resource/development tensions. The Solar PEIS above all should establish a framework that facilitates this process on all projects and provides guidance towards how these conflicting interests should be addressed.

Thank you for this opportunity to provide comments. If you have any further questions, please feel free to contact me at 781-898-4799 or by e-mail at smcintyre@vermontlaw.edu.

Sincerely,

Siobhan McIntyre
JD Candidate 2011
Vermont Law School
P.O. Box 263
S. Royalton, VT 05068
smcintyre@vermontlaw.edu

*the views I have expressed are my own and do not represent the views or opinions of Vermont Law School.

Thank you for your comment, Penny Mason.

The comment tracking number that has been assigned to your comment is SolarD11791.

Comment Date: April 30, 2011 16:23:59PM
Solar Energy Development PEIS
Comment ID: SolarD11791

First Name: Penny
Middle Initial:
Last Name: Mason
Organization:
Address: P.O. Box 1491
Address 2:
Address 3:
City: Joshua Tree
State: CA
Zip: 92252
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I am not in favor of the project as it currently proposed. The fact that the project surrounds the southern portion of the JTNP Wilderness, will disrupt wildlife corridors and destroy habitat of wildlife, some endangered (tortoise, burrowing owls), make this project unacceptable in it's current form. The proximity to JTNP is a large concern. The park is already suffering stress from encroachment through development and smog.

Thank you for your comment, Angela Scott.

The comment tracking number that has been assigned to your comment is SolarD11792.

Comment Date: April 30, 2011 16:44:52PM
Solar Energy Development PEIS
Comment ID: SolarD11792

First Name: Angela
Middle Initial: N
Last Name: Scott
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

Hello, I hope that we all understand that this small creature has endured so much. The area is critical habitat for our State Reptile. They should not be cast aside to make way for a green project...kind of not in line with our use of a natural source by means of extermination of another native species. If we are so readily willing to do away with the Desert Tortoise who is to say we are not ourselves stepping closer to our own extinction ...after all we are simply another species on this planet. This big organization can certainly use the relocation of tortoises money by purchasing a less critical part of our beautiful living desert.
Thank you and best wishes.

Thank you for your comment, Deborah Michalak.

The comment tracking number that has been assigned to your comment is SolarD11793.

Comment Date: April 30, 2011 17:53:49PM
Solar Energy Development PEIS
Comment ID: SolarD11793

First Name: Deborah
Middle Initial: K
Last Name: Michalak
Organization:
Address: PO Box 604
Address 2: 363 E Copper Ave
Address 3:
City: Crestone
State: CO
Zip: 81131
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

To Whom It May Concern,

I am very concerned about large-scale solar projects being erected on public lands that are supposed to be for preservation of wildlife, natural beauty and open space. It is my understanding that these projects have a lot of pitfalls and that it is the large corporations, like Chevron and BP, who have the initiative to undertake these projects. These corporations don't have a good track record of mitigating damages caused to natural lands, and so it seems foolhardy to subsidize them with government money. It is also my understanding that the BLM has a choice here; that it's not mandated that they offer their land to these projects.

If, after reading the public comments, the BLM decides to give land, I would like them to give only disturbed lands such as Superfund sites.

Sincerely,

Deborah Michalak

Thank you for your comment, Elizabeth Michalak.

The comment tracking number that has been assigned to your comment is SolarD11794.

Comment Date: April 30, 2011 18:20:57PM
Solar Energy Development PEIS
Comment ID: SolarD11794

First Name: Elizabeth
Middle Initial: S
Last Name: Michalak
Organization:
Address: Post Office Box 604
Address 2:
Address 3:
City:
State:
Zip:
Country:
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Dear BLM Representatives,

It has come to my attention that the BLM is considering allowing the development of instrustial solar on public lands, and that they are using the '05 Energy Policy Act as justification. According to Janine Blaeloch, lead author of "US Public Lands Solar Policy: Wrong From The Start," this policy contains no mandate for renewable energy generation on public lands. Because industrial solar is optional as far as policy is concerned, I urge the BLM to push for research into alternative means to solar energy before irreversibly determining the use of precious open space.

Industrial-scale solar is a huge undertaking with lasting impacts, and if it's worth spending the time and money to conduct a PEIS, isn't it also worth researching alternatives, to insure that this nation's resources are used in the most efficient manner? Certainly, such research would be outside the BLM's scope, but it is within their scope to refuse the use of their land until or unless its use can be proven, through thorough and unbiased surveys, to be the smartest long-term choice for our country as a whole—not just for the BLM's financial picture or for corporate interest.

Even if it is decided that centralized, as opposed to distibuted, solar, makes the most sense, the BLM should require all solar projects to be restricted to lands which have already been damaged and are unusable for other purposes, such as mine lands.

Thank you for considering my comments.

Sincerely,

Elizabeth Michalak
719-588-0287

Thank you for your comment, Charles Wittman.

The comment tracking number that has been assigned to your comment is SolarD11795.

Comment Date: April 30, 2011 21:19:02PM
Solar Energy Development PEIS
Comment ID: SolarD11795

First Name: Charles
Middle Initial:
Last Name: Wittman
Organization: Architectural Fiberglass Corp
Address: 1395 Marconi Blvd
Address 2:
Address 3:
City: Copiague
State: NY
Zip: 11726
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Solar energy should be developed only in solar energy zones that don't compromise national park wildlife, scenery, archaeological sites, water resources, night sky viewing, and the opportunity for present and future generations to fully enjoy America's heritage.

Thank you for your comment, Christopher Lish.

The comment tracking number that has been assigned to your comment is SolarD11796.

Comment Date: April 30, 2011 21:20:02PM
Solar Energy Development PEIS
Comment ID: SolarD11796

First Name: Christopher
Middle Initial:
Last Name: Lish
Organization:
Address:
Address 2:
Address 3:
City: Olema
State: CA
Zip: 94950
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Subject: Make Solar "Smart from the Start" to Protect Wildlife Habitat (DOE-HQ-2009-0003-0996 and DOE-HQ-2009-0003)

Dear Secretary Ken Salazar,

I strongly support our nation's need to immediately transition from dirty coal and fossil fuels to clean renewable energy. I also strongly support protection of our public lands. We can do both!

The recently released Solar Energy Draft Programmatic Environmental Impact Statement (DPEIS) is an important step forward for solar energy development in the U.S. because it encourages renewable energy development while endeavoring to protect wildlife. The designation of Solar Energy Zones (SEZs) is one important way that the Solar Energy Draft PEIS accomplishes this goal.

As our country moves to develop renewable energy projects that will help us end our reliance on foreign oil, buffer us from climate change, and promote national security, we have an opportunity to ensure that solar facilities are installed responsibly without harming our national parks, Wilderness and other Wilderness-quality lands, or endangered and/or threatened species habitat. Solar energy should be developed only in SEZs that don't compromise national park wildlife, scenery, archaeological sites, water resources, night sky viewing, and the opportunity for present and future generations to fully enjoy America's heritage.

While concentrating solar development within specified zones makes sense, several of these SEZs threaten the resources of some of our most iconic desert national parks—like Death Valley National Park and Joshua Tree National Park. I strongly encourage that a more common sense approach be adopted that protects these spectacular places, their abundant wildlife, pristine night skies, clean air, and water resources. This means eliminating or reconfiguring the boundaries of SEZs that would disrupt wildlife corridors, cause air and light pollution, impair spectacular vistas and drawdown water resources. It should also mean prohibiting the siting of new SEZs—or new solar development in general—within at least 15 miles of national parks unless the National Park Service determines that the proposed development does not unacceptably impact or diminish national park resources or visitor enjoyment. Finally, it is vital that the BLM include proposed national parks, wilderness areas, and national monuments as high conflict areas for industrial solar development.

I strongly believe that four SEZs need to be modified:

1. California's Iron Mountain SEZ must be eliminated because of its harmful impacts to wildlife, water resources, night sky viewing, and scenic vistas from Joshua Tree National Park.

2. California's Riverside East SEZ must be reduced in size and its boundaries reconfigured to minimize damage to wildlife corridors and viewsheds from Joshua Tree National Park wilderness.

3. Nevada's Amargosa Valley SEZ is simply too close to Death Valley National Park wilderness and would negatively affect park wildlife and drawdown precious water resources, resulting in a threat to the endangered Devil’s Hole Pupfish and surrounding wetlands. The Amargosa Valley SEZ must be reduced or reconfigured to reduce these negative impacts.

4. Similarly, the Red Sands SEZ threatens water resources critical to wildlife and the formation of desert dunes at White Sands

National Monument.

The Solar Energy Draft PEIS can also be made even stronger by limiting solar energy development to only 23 Solar Energy Zones (the 24 SEZs proposed in the DPEIS minus the Iron Mountain SEZ). While a process should be established to formally identify and review additional solar zones, until then, additional public land outside the 23 zones should not be developed because:

1. the need for additional space for development has not yet been demonstrated; and
2. the additional land has not been thoroughly examined for possible wildlife conflicts.

I also encourage the Department of the Interior to make sure that in cases where crucial habitat for (both listed and nominated) endangered and threatened species overlap with SEZs, these critical habitat areas will also placed off-limits to development.

I believe that solar energy must be developed quickly in the United States. However, the best way to get solar energy projects built quickly is to plan them responsibly from the start. Please take these steps to make sure that America's solar industry is developed in a smart, ecologically sound manner that protects our national treasures and wildlife. Once amended, I will strongly support the Solar Energy Zone alternative, which would concentrate solar development within parcels of land that avoid needless future conflicts with national park resources and sensitive desert ecology. With a strong Solar Energy PEIS, we can ensure that we set the best precedent for solar energy development in our country.

Thank you for your consideration of my comments. Please do NOT add my name to your mailing list. I will learn about future developments on this issue from other sources.

Sincerely,
Christopher Lish
Olema, CA 94950

Thank you for your comment, Todd Barr.

The comment tracking number that has been assigned to your comment is SolarD11797.

Comment Date: April 30, 2011 22:54:15PM
Solar Energy Development PEIS
Comment ID: SolarD11797

First Name: Todd
Middle Initial:
Last Name: Barr
Organization:
Address: P.O. Box 511
Address 2:
Address 3:
City: Manassa
State: CO
Zip: 81141
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I stongly oppose any solar developement or such consideration on BLM lands, including the Kiowa Hill allotment on which we are permitted to graze cattle. The maps indicate, by color, that the area in which we are permitted would not be allowed for such developement (solar). Resource protection is our greatest concern, and may be jeopardized by such developement.

Thank you for your comment

The comment tracking number that has been assigned to your comment is SolarD11798.

Comment Date: May 1, 2011 09:08:42AM
Solar Energy Development PEIS
Comment ID: SolarD11798

First Name: [Withheld by requestor]
Middle Initial:
Last Name: [Withheld by requestor]
Organization:
Address:
Address 2:
Address 3:
City:
State:
Zip:
Country:
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

I favor solar and wind power and oppose power supplied by coal.

Thank you for your comment, Gary Thomasian.

The comment tracking number that has been assigned to your comment is SolarD11799.

Comment Date: May 1, 2011 17:32:02PM
Solar Energy Development PEIS
Comment ID: SolarD11799

First Name: Gary
Middle Initial:
Last Name: Thomasian
Organization:
Address: 23512 Spindle Way
Address 2:
Address 3:
City: Murrieta
State: CA
Zip: 92562
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I support the development of Domestic Renewable Energy which will help to stimulate new jobs and further create new research and development opportunities.

This mandate should not be at the expense of changing the existing Wilderness Landscape which is part of our American Heritage.

With so much uncertanity and conflict swirling around the 24 solar energy zones this will only keep the attorneys knee deep in financial gain but will have little to show for meeting the goal of generating 10K Megawatts of solar energy on public lands.

I propose that by installing solar generating panels on all roof tops within Metropolitan areas we can avoid the conflicts and still achieve our Energy Independence.

Thank you

Thank you for your comment, Yvette Winston.

The comment tracking number that has been assigned to your comment is SolarD11800.

Comment Date: May 1, 2011 17:54:20PM
Solar Energy Development PEIS
Comment ID: SolarD11800

First Name: Yvette
Middle Initial: M
Last Name: Winston
Organization:
Address: 1328 E 48th St
Address 2:
Address 3:
City: Chicago
State: IL
Zip: 60615
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Solar energy should be developed only in solar energy zones that don't compromise national park wildlife, scenery, archaeological sites, water resources, night sky viewing, and the opportunity for present and future generations to fully enjoy America's heritage.

Thank you for your comment, David Beaumont.

The comment tracking number that has been assigned to your comment is SolarD11801.

Comment Date: May 2, 2011 00:45:12AM
Solar Energy Development PEIS
Comment ID: SolarD11801

First Name: David
Middle Initial:
Last Name: Beaumont
Organization: Mojave Trails Group
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

Solar PEIS Comment
From: David Beaumont, Founder Mojave Trails Group

This document is in violation of NEPA.

The entire document, and the resulting section, A.2.2.6, which includes mitigation for Recreational Impacts, fails to establish mitigation for a wide variety of other lawful recreational uses of public lands.
Examples of such are as follows, but not limited to:

Access for the handicapped, physically challenged, or aged individuals; Rock Hounding; Star Gazing using mechanical devices; campsites where access was achieved by motorized vehicles; hunting activities; in short, any type of recreation which requires the use of motorized vehicles to transport people and their equipment for such recreational activities.

To correct this omission the following shall be done:
1. Conduct a study to fully and clearly identify all motorized vehicle dependant recreational activities in the SEZ's, and the specific locations of such activities inside the SEZ's, of all states affected.
2. Establish that it shall be the policy of this document to afford mitigation for the loss of all recreation of the types identified in the study established in item "1" above.
3. Establish that it shall be the policy of this document that such mitigation lands shall be of equal or greater value to the recreational interests which have suffered loss.
4. Change the meaning and contents of the first sentence of the third (3rd) bullet point under A.2.2.6 Design Features For Recreation Impacts from:
"Replacement of acreage lost for off-highway vehicle use shall be considered as part of the analysis of project-specific impacts." to read and mean as follows: " Replacement of acreage lost for off-highway vehicle use, and any other motorized vehicle dependant recreational activity, shall be mitigated with equal, or better, opportunities to maintain the overall quality of recreation for a wide variety of human experiences."

Sincerely,
David Beaumont
Mojave Trails Group
savecaliforniasdeserts@gmail.com

Thank you for your comment, Bradford Berger.

The comment tracking number that has been assigned to your comment is SolarD11802.

Comment Date: May 2, 2011 00:51:14AM
Solar Energy Development PEIS
Comment ID: SolarD11802

First Name: Bradford
Middle Initial: W
Last Name: Berger
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

Yes, we need to develop solar power, and we need to do it immediately. However, to allow the public land in our desert regions to be decimated by open access by private solar companies, or even nationalized ones, will cause a devastating loss of habitat, wildlife corridors, and open space.

If solar arrays are to be installed, they should be installed on already degraded lands - the Imperial Valley has much agricultural land that due to water and salinity issues is no longer useful - these should be used first.

Solar arrays installed on pristine desert is just plain wrong. The roads that must be made to install and service the arrays are very destructive. The water to clean the panels is scarce and needed for other uses.

We must balance our energy use with land conservation. Covering the southwest with solar panels is just a business-as-usual knee-jerk reaction. We need an integrated approach where power isn't transported to far-away cities, but used where it's produced.

In closing, please limit solar arrays to already degraded agricultural lands and do not allow the arrays to be placed on pubilc lands.

Thank you,
Bradford W. Berger

Thank you for your comment, Bradley Powell.

The comment tracking number that has been assigned to your comment is SolarD11803.

Comment Date: May 2, 2011 09:42:33AM
Solar Energy Development PEIS
Comment ID: SolarD11803

First Name: Bradley
Middle Initial: E
Last Name: Powell
Organization: Arizona Wildlife Federation
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Address 3:
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State: AZ
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Privacy Preference: Don't withhold name or address from public record
Attachment: awfsolarcomment.doc

Comment Submitted:

May 02, 20011
Draft Solar Energy Programmatic EIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, IL 60439

RE: Comments on the Draft Solar PEIS for solar Energy Development in Six Southwestern States

Dear Solar PEIS Project Team,

The Arizona Wildlife Coalition is the States oldest wildlife conservation organization and is an affiliate of the National Wildlife Federation. Our membership represents a wide spectrum of Arizona's outdoor community. We are committed to the stewardship of Arizona's public lands, to protect and enhance fish and wildlife habitats and to increase public access to quality hunting and fishing.

We heartily support the planning efforts of the Bureau of Land Management to guide the development of solar energy resources on public lands in the Southwest. The haphazard implementation of energy development across the west has resulted in significant impacts to fish, wildlife, air and water resources. It's our hope that this planning effort can help chart a course that is much better balanced relative to the development of energy and the protection of important fish and wildlife habitats.

We appreciate the massive effort it took to complete the analysis contained in this 10,000 page solar EIS. We are encouraged by the development of a zone concept to guide development in the future but are perplexed at the logic that guided the development of the preferred alternative. The EIS clearly points out that the solar zones will provide more than enough acreage to allow for the commercial development of solar resources that is projected.

We offer the following general recommendations:

- Utilize the Zones identified in the Solar PEIS for future utility scale development. The zones encompass 675,000 acres and contain adequate acreage to meet the projected solar energy production needs.
- Develop a process for the refinement and expansion of zones for future development. This process should involve adequate analysis and public involvement.
- Carefully review any proposed analysis within the zones to minimize impacts to fish and wildlife resources. While the analysis is significant in the PEIS it is still not site specific enough to ensure that the solar projects are conducting in a manner that reduces impacts to the publics resources. Consider offsite mitigation when necessary to offset impacts.

- The use of non competitive right of way permits is archaic and not well suited for energy development projects on BLM lands. Competitive leasing or other methods designed to ensure that the public's resources are valued and administered appropriately are needed.
- Currently there are many solar lease applications being held by the BLM that were received prior to the development of this EIS. These lease applications should be analyzed and treated consistent with the zones concept in this PEIS. Proponents of these lease applications should be provided the opportunity to withdraw their proposal or adjust it to an area within the solar energy zones.

Our specific comments relative to Arizona are as follows:

Under the Preferred Alternative, the BLM will make available 4.4 million acres for industrial solar in Arizona. Of this 4.4 million, 0.5%, or 21,816 acres, would be developed as outlined in the Reasonable Foreseeable Development Scenario (RFDS). This is 48% of Arizona's BLM land being opened for development, but less than .5% predicted for development in the next 20 years. Of all states included in the Preferred Alternative, Arizona holds the highest percentage of BLM lands, yet offers the lowest RFDS acreage.

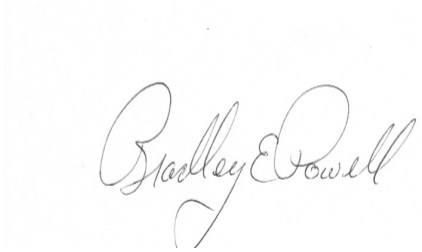
Preferred Alternative Impacts on Big Game:
Mule deer: All 4.4 million acres available for solar development under the Preferred Alternative in Arizona challenge mule deer populations. While crucial winter ranges and migration corridors have been excluded from the Preferred Alternative regions, desert basin and range scenarios exist, i.e., Arizona's southwestern corner and along the western border. The Preferred Alternative does open 179,000 acres of mule deer winter range to potential development. Watering holes and quality habitats are more important in these areas. Development will infringe on healthy habitats and force deer into more marginal habitats. A region of considerable concern for winter range is Arizona Game and Fish Department Region hunt area 12a, the Kaibab Plateau near Lee's Ferry, well known for its trophy class bucks that attract hunters from around the world. A majority of mule deer winter range on the northern and southeastern edges of Marble Canyon is slated for solar development. Development of these regions has the potential to irreversibly affect the prized Kaibab Plateau mule deer herd.

Bighorn Sheep: Regions within prime bighorn sheep habitats along Arizona's western border, and regions in the Arizona Strip, are at threat under the Preferred Alternative. Separation of critical migration corridors could introduce herd commingling, which would adversely affect genetic diversity
Pronghorn: Arizona Game and Fish Department Region 3 hunt areas, and the Arizona Strip portions of Region 2 will be directly impacted by the Preferred Alternative; the majority of large, intact pronghorn habitats on BLM lands will be open for development. Arizona is known throughout the world for its trophy-sized pronghorns. These pronghorn illustrate a tradition of conservation in the state and also contribute to the local economy. The regions available for development in the Arizona Strip have been identified as some of the highest quality habitats for pronghorn by the Arizona Game and

Fish. Habitat fragmentation, road development and closed access, are all probable scenarios should the Preferred Alternative be fully developed.
Upland Game Birds: Under the Preferred Alternative, access to quail and dove hunting areas could be denied. Consultation with local hunting and fishing clubs and Arizona Game and Fish is imperative prior to project design.

Arizona Solar Energy Zone (SEZ) Alternative:
Under the SEZ Alternative, Arizona would make available 13,735 acres to solar development, in 3 SEZs. These include: Brenda (3,878 acres), Bullard Wash (7,239 acres), and Gillespie (2,618 acres). Each of these three zones does include habitat for Gambel's quail, mourning dove, white winged dove, cougars, and mule deer, but none have been identified as critical habitat.

We do appreciate the opportunity to participate in this important planning process for the development of utility scale solar power on BLM lands in the West. We look forward to working closely with the BLM to refine this document to help guide a responsible renewable energy program on public lands for the future.



Bradley Powell
Vice President
Arizona Wildlife Federation

Thank you for your comment, Kenneth Lytle.

The comment tracking number that has been assigned to your comment is SolarD11804.

Comment Date: May 2, 2011 11:46:47AM
Solar Energy Development PEIS
Comment ID: SolarD11804

First Name: Kenneth
Middle Initial: E
Last Name: Lytle
Organization: Lytle Ranches
Address: HC 74 Box 245
Address 2:
Address 3:
City: Pioche
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Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Ken's solar comment letter II.rtf

Comment Submitted:

May 2, 2011

Solar Energy PEIS
Argonne National Laboratory
9700 South Cass Avenue – EVS/900
Argonne, Illinois 60439

RE: Second comments to the Solar Programmatic Environmental Impact Study

To Whom It May Concern:

My family has been ranching in Nevada for almost 150 years, and I am a fourth-generation rancher in that same business. For over 100 years we have been using the area that you have labeled Dry Lake Valley North on your maps outlining proposed solar locations. The Simpson allotment and everything north of that constitutes our entire winter/spring grazing allotments where our cows graze from November through April. Without the use of this area, we would be forced out of the cattle ranching business. Not only do we use this area, but four other large ranching operations operate here as well. I feel that there is only one section of this proposed area that may be suitable for solar and that would be the portion labeled as the Ely Springs Cattle and Sheep allotments. Recently that section of the proposed area was purchased by Vidler Water, a company that has expressed a desire to house solar facilities on its allotment.

Besides being a crucial area for some of Lincoln County's largest ranching operations, I feel that the Dry Lake Valley North area is also unsuitable for solar development for other reasons. First of all, one of the main types of vegetation that grow in the area is white sage (or winter fat), a very delicate plant that is ideal for grazing. This plant is easily destroyed by man-made traffic and can not be reestablished. If a plant dies, it is gone forever. Dry Lake Valley North definitely represents some of the best winter grazing land in the state of Nevada. It seems ludicrous that this area would even be considered as a site for solar facilities. Secondly, the area is very dusty. Most times of the year, a fine, powdery silt becomes airborne since some degree of wind is usually blowing. I believe dust and solar facilities don't mix well. Next, the ranchers in the area not only lose all or most of their winter AUMs (animal units per month), but they also lose thousands of summer AUMs since it is impossible to sustain their herds without the winter portion. Most importantly, these ranchers also lose their stock-based vested water rights (all of these ranches own a considerable amount of vested water rights dating back into the 1800s) since they have little or no cattle to show beneficial use. I believe compensating these ranchers for their water losses (property which they own) would prove to be very costly. Finally, these ranching operations are very important to the economy of Lincoln County; it is essential that this area of Dry Lake Valley remain intact for these ranches to survive.

In 2009 at a meeting in Caliente, Nevada, with BLM personnel and ranchers in the area, several alternative sites were selected to replace those containing areas with grazing allotments that are currently being used. For some reason, the alternative sites were just

added to your study and the original grazing sites remained in the study. It feels as if our hard work and comments were completely ignored. I would strongly urge you to replace the current proposed solar areas with these other suggested sites that have few, if any, detrimental effects or impacts. Most of these outlined areas contain dry lake beds with little vegetation or surface areas that are not suitable for adequate grazing. These sites also have power transmission lines running adjacent to them, making them more ideal than the present locations.

In closing, I would like to request that you redefine the Dry Lake Valley North area to include only the Ely Springs allotments. I would also like to urge you to consider the alternate sites outlined in the scoping meeting in order to cause the least amount of adverse effects.

Sincerely,

Kenneth Lytle
Permittee in the Dry Lake Valley North proposed solar area

Thank you for your comment, Donna Lytle.

The comment tracking number that has been assigned to your comment is SolarD11805.

Comment Date: May 2, 2011 11:56:21AM
Solar Energy Development PEIS
Comment ID: SolarD11805

First Name: Donna
Middle Initial: B
Last Name: Lytle
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Address 3:
City: Pioche
State: NV
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Country: USA
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Attachment: Donna's solar comment letter II.rtf

Comment Submitted:

May 2, 2011

Solar Energy PEIS
Argonne National Laboratory
9700 South Cass Avenue – EVS/900
Argonne, Illinois 60439

RE: Second Comments to the Solar Programmatic Environmental Impact Study

To Whom It May Concern:

I am writing this letter in protest to the proposed solar area in Dry Lake Valley North. I disagree strongly with a large portion of this area being designated as a future solar site. In fact, the only section I believe should become a possible site is the Ely Springs allotments since the owner (Vidler Water) of those allotments expressed a wish to place solar facilities on his portion of the area.

There are several reasons for my protest. First of all, from the Simpson allotment all the way to the top northern boundary makes up our total winter/spring grazing allotment. Not only does our entire cattle herd spend the cold winter months in this area, but it also serves as the calving grounds for our cattle since the temperatures are a bit more moderate than any other locations we have. Without this land, our ranching operation would go out of business, along with four other large ranches in Lincoln County. Since our family has been in the business for over 150 years, not only would these consequences destroy our heritage, they would also be detrimental to the economy of Lincoln County since we ranchers make up a large portion of the tax base. Not only would our winter grazing lands become useless, but our summer ranges with thousands of AUMs and over 100 stock watering rights, would also be of no use to us since we no longer would have cattle to use them. Our herd numbers are dependent on the numbers of cattle we are able to place in the Dry Lake Valley since it is impossible to purchase feed or to physically undertake that burden for the large numbers we are able to locate in Dry Lake. Because of the recent Wayne Hage court decision, I believe it would also be very costly for the government or for the developer to compensate us for our range improvements and for our numerous vested water rights.

In addition to the great financial burden placed on all parties involved, there would also be great environmental impacts. Our portion of the Dry Lake Valley makes up some of the best winter grazing areas in all of Nevada, primarily because of the abundance of white sage. Once this plant is destroyed, studies have shown that there is very little or no success with trying to reintroduce it to an area. Additionally, because of the soil type that exists in the area, any disturbance to the vegetation there would turn the area into a dust bowl. Already there is much dust that circulates throughout these sections. In fact, I believe the prevalent amount of dust already present in the area would not mix well with the solar equipment.

Presently we have a 31-mile pipeline that brings water to 5 reservoirs throughout our allotment. These reservoirs not only provide water for our cattle, but they also supply the wildlife and the wild mustang herd in this area with water. Without our water rights and our pipeline, these reservoirs would become dry, and the wild horse herds and wildlife would suffer greatly. We also have two wells located at two of the reservoirs that are included in the range improvements made by members of these local ranching families. Again, compensation would be extremely expensive.

At a recent meeting at the Caliente BLM, local ranchers met with Wells McGiffert, the Ely BLM Renewable Energy Project Manager, and proposed alternate sites. For some reason, our work and collaboration was ignored and the alternate sites were just added to the original proposed area. We were told that the alternate sites would replace the original. I urge you strongly to consider these proposed sites and to redefine any of the current locations that detrimentally impact local ranchers. Moreover, Nevada has numerous sites with little or no impact that invite solar developers to take advantage of. I would first urge you to place these sites on any private lands that are inviting developers; for example, the Seno Brothers' (previously owned by Harvey Whitamore) Coyote Springs, a Lincoln County development, has set aside over 8,000 acres for solar development. I am also wondering why the huge area of the Nevada Test Site has not been considered for these projects since it is currently managed by the government and has the perfect resources available to accommodate these sites; this area would also eliminate negative impacts to individuals who enjoy or rely upon the multiple use aspect of public lands. I believe your findings will guide all future developers to the sites which you select. Please give the areas careful consideration before selecting them in order to minimize adverse effects to everyone.

Sincerely,

Donna Lytle
Lytle Ranches and Permittee in the Dry Lake Valley North proposed solar area

Thank you for your comment, Michael Connor.

The comment tracking number that has been assigned to your comment is SolarD11806.

Comment Date: May 2, 2011 12:02:29PM
Solar Energy Development PEIS
Comment ID: SolarD11806

First Name: Michael
Middle Initial: J
Last Name: Connor
Organization: Western Watersheds Project
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Address 2:
Address 3:
City: Reseda
State: CA
Zip: 91337
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: 05-02-11-WWPCommentsSolarDPEIS.pdf

Comment Submitted:

Michael J. Connor, Ph.D.
California Director
P.O. Box 2364, Reseda, CA 91337-2364
Tel: (818) 345-0425
Email: mjconnor@westernwatersheds.org
Web site: www.westernwatersheds.org

Working to protect and restore Western Watersheds

May 2, 2011

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue-EVS/240
Argonne, IL 60439

Filed electronically through: http://solareis.anl.gov

COMMENTS ON THE DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES

To whom it may concern:

Western Watersheds Project thanks you for the opportunity to comment on the Department of Interior Bureau of Land Management ("BLM") and Department of Energy ("DOE") joint Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States ("DPEIS").

Western Watersheds Project works to protect and conserve the public lands, wildlife and natural resources of the American West through education, scientific study, public policy initiatives, and litigation. Western Watersheds Project has over 1,600 members nationwide with offices in Arizona, California, Idaho, Montana, Utah, and Wyoming. Western Watersheds Project, as an organization and on behalf of its members, is concerned with and active in seeking to protect and improve wildlife habitats, riparian areas, water quality, and other sensitive resources and ecological values.

Western Watersheds Project recognizes that global climate change poses new challenges to our already stressed public lands. However, while climate change threatens biodiversity and entire fragile ecosystems, our response to climate change also threatens our public lands and their wildlife. Accordingly, WWP supports responsible development of power plant projects. Responsible development requires the use of comprehensive, ecologically sound, science-based analysis in determining power plant locations. This is best achieved by focusing energy developments on private or severely altered lands that are located close to points of use to minimize new disturbance or further fragmentation of fragile, native ecosystems. The ecological impacts from renewable energy project development should be fully mitigated with significant and lasting actions.

Western Watersheds Project has actively participated in the scoping process. We submitted scoping comments from our Boise, Idaho Office on July 7, 2008, from our California Office on July 15, 2008, and additional scoping comments from our California Office on September 10, 2009.

In our comments on the DPEIS we have followed the general approach of the DPEIS documents, and address the overall evaluation first followed by some comments on the individual state analyses. Because the mission of Western Watersheds Project is to protect public lands and their resources most of our comments are directed to the BLM.

1. INTRODUCTION, AND PURPOSE AND NEED

Western Watersheds Project does not believe that the best use of any of our Nation's multiple-use public lands is for single-use, industrial-scale energy development, nor do we believe industrial-scale energy development on public lands to be consistent with the Federal Land Policy Management Act ("FLPMA"). We do believe that the federal government should look to ways it can promote distributed energy, and use of brown fields, and other degraded areas within urban areas for industrial production to ensure that as many diverse wildlife habitats and areas of connectivity persist to facilitate changes species distribution due to climate change. That approach best protects and enhances the Nation's water, wildlife, and other natural resources as required by Secretarial Order 3285A1.

FLPMA mandates the BLM to manage the public lands "in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values" and to "manage the public lands under principles of multiple use and sustained yield." The utility-scale solar energy developments envisioned in the PEIS would require landscape level conversion of desert lands into vast industrial tracts. These tracts will be permanently and irreversibly degraded, and will no longer be available for multiple-use. Although the life of the solar power plants themselves is only expected to be 20-30 years, the character of these public lands will be permanently changed. FLPMA's mandates should be the primary driver for this planning process.

The DPEIS cites a number of Executive Orders, Congressional acts, and federal agency orders and policies that it states establish requirements for the agencies related to renewable energy development and that provide the drivers for specific actions being taken or being proposed by these agencies to facilitate solar energy development. DEIS at 1-2.

Executive Order 13212: Signed by President Bush on May 18, 2001 this Executive Order states "For energy-related projects, agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, ***and environmental protections***. (Our emphasis added).

Energy Policy Act of 2005: Section 211 of the Act states, "It is the sense of the Congress that the Secretary of the Interior should, before the end of the 10-year period beginning on the

date of enactment of this Act, seek to have approved non-hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity."

This is a recommendation by Congress, not a mandate. There is no obligatory requirement for the Secretary to do so, nor is there language in the Energy Policy Act that allows the Secretary to short-change environmental protections or identify large slabs of public lands for industrial development. The repeated claim made in the DPEIS that the Energy Policy Act requires the Secretary to approve 10,000 megawatts of new energy plants is simply untrue.

Energy Independence and Security Act of 2007: Section 603 of the Energy Independence and Security Act of 2007 requires the DOE to assess methods to integrate electric power from utility-scale solar facilities into regional electricity transmission systems, to identify transmission system expansions needed to move solar-generated electricity to growing electricity demand centers, and to consider methods to reduce the amount of water consumed by concentrating solar power systems. There is no mandate to use public lands for industrial solar development.

Secretarial Order 3285A1: This amended secretarial order dated February 22, 2010 sets a policy of "Encouraging the production, development, and delivery of renewable energy is one of the Department's highest priorities. Agencies and bureaus within the Department will work collaboratively with each other, and with other Federal agencies, departments, states, local communities, and private landowners to encourage the timely and responsible development of renewable energy and associated transmission ***while protecting and enhancing the Nation's water, wildlife, and other natural resources***. (Our emphasis added). It also calls for development of a strategy for "identifying and prioritizing the specific locations in the United States best suited for large-scale production of solar, wind, geothermal, incremental or small hydroelectric power on existing structures, and biomass energy (e.g., renewable energy zones)."

National Environmental Policy Act ("NEPA") Sec. 1502.13 requires that an EIS specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action. NEPA review cannot be "used to rationalize or justify decisions already made." 40 C.F.R. § 1502.5; Metcalf v. Daley, 214 F.3d 1135, 1141-42 (9th Cir. 2000). The statement of purpose and need is closely tied to the alternatives reviewed in a NEPA process since "the stated goal of a project necessarily dictates the range of 'reasonable' alternatives." City of Carmel, 123 F.3d at 1155. The Ninth Circuit reaffirmed this point in National Parks Conservation Assn v. BLM, 586 F.3d 735, 746-48 (9th Cir. 2009) (holding that "[a]s a result of [an] unreasonably narrow purpose and need statement, the BLM necessarily considered an unreasonably narrow range of alternatives" in violation of NEPA).

According to the DPEIS:

The scope of this PEIS is limited to utility-scale solar development, in part, because the Energy Policy Act of 2005 and DOI Secretarial Order 3285A1 require that the BLM take steps to facilitate development at that scale (see Section 1.1). The development of distributed generation, small-scale solar energy

facilities, such as roof-top mounted PV systems, is not included in the scope of this PEIS. While such solar energy development will be an important component of future electricity supplies (and is the focus of separate DOE initiatives; see Section 2.5.1), current research indicates that development of both distributed generation and utility-scale solar power will be needed, along with other energy resources and energy efficiency technologies (NREL 2010c). One analysis of available roof space concluded that up to 23% of required electricity supplies could be met with roof-top PV systems, although integrating PV into the electric grid at levels that high could be challenging (Denholm and Margolis 2008). On a per watt basis, small-scale PV systems are more expensive than utility-scale systems (NREL 2010c). DPEIS at 1-4;

The DPEIS states that BLM has identified utility-scale solar energy development as a potentially critical component in meeting the applicable orders and mandates discussed in Section 1.1. However, the DPEIS provides no meaningful justification as to why utility scale solar on public land is a critical component in meeting the listed Executive Orders, Congressional acts, and federal agency orders. It provides no justification for eliminating other alternatives off the bat such as distributed generation, promotion of small-scale facilities, and facilitating the use of private lands (even though Secretarial Order 3285A1 expressly requires "agencies and bureaus to work collaboratively with … private landowners to encourage the timely and responsible development of renewable energy and associated transmission."). The citations provided such as NREL 2010c are not primary references, not comprehensive, and not up to date.

The Purpose and Need section ignores the large amount of public land that is already being developed for solar power plants and the expected amounts of energy that would be generated. In the California Desert Conservation Area alone current solar energy project planning and development that is underway would produce over 19,100 MW from public lands, and a number of additional projects on public lands have been approved in Nevada.

Nor does the Purpose and Need section address the Secretary's clear direction to protect and enhance the Nation's water, wildlife, and other natural resources. Our public lands are the last, best places for native wildlife and rare plants. In the context of climate change, maintaining broad swaths of untrammeled landscapes connected by matrix habitat is the only approach to maintaining the flexibility needed to ensure that the greatest number of species will be able to move and adapt to changing conditions. Fragmentation through solar developments, and the accompanying transmission lines and roadways, reduces the chances of these species survival.

In sum, the BLM's Purpose and Need section is overly narrow and constrained in violation of NEPA, and does not even meet the requirements of many of the orders, acts and policies that the BLM claims to be driving this process.

2. RANGE OF ALTERNATIVES

The selection and clear presentation of alternatives is the "the heart" of the NEPA process. NEPA requires the agencies to evaluate and compare a range of reasonable alternatives.

The BLM considers the following three alternatives in the DPEIS:

(1) A **no action** alternative that continues the issuance of right-of-way (ROW) authorizations for utility-scale solar energy development on BLM administered lands by implementing the requirements of the BLM's existing solar energy policies on a project-by-project basis. Lands available for solar energy development would include those areas currently allowable under existing applicable laws and statutes (approximately 99 million acres in the six-state study area) and in conformance with the approved land use plan(s).

(2) The **proposed action**. A solar energy development program alternative that applies new program administration and authorization policies and design features for utility-scale solar energy development on BLM-administered lands to a subset of BLM administered lands that would be available for solar energy ROW applications (approximately 22 million acres. Within the available lands, the BLM would identify approximately 677,400 acres (2,741 km^2) in solar energy zones, which are lands identified by the BLM as best-suited for utility-scale production of solar energy and where the BLM would prioritize development (as well as development of associated transmission infrastructure).

(3) A **solar energy zone (SEZ) alternative** that applies the same new program administration and authorization policies and design features to utility-scale solar energy development but restricts applications to SEZs only (up to approximately 677,400 acres in the six-state study area).

All three alternatives considered in the EIS would result in similar levels of industrial-scale solar power plant development in the desert and/or would not achieve the stated purpose and need:

Alternative (1) the "no action" alternative would allow development to continue as it currently proceeds. Since all approved projects are now being litigated, this is clearly not an efficient and effective approach;

Alternative (2) the preferred alternative is poorly and incompletely described. It consists of identifying solar energy zones (SEZ) where BLM staff would prioritize applications and an additional, enormous area that would be open for development but where applications would receive a lower priority treatment from staff. The DPEIS does not explain why the BLM even wants to propose opening up 100 times more land than it has identified any need for, nor has staff to handle. How is this going to help the BLM respond in a more efficient and effective manner to solar power plant applications? How does this alternative protect and enhance the Nation's water, wildlife, and other natural resources? In fact, this alternative appears to have been thrown in at the last minute given the statement in the DPEIS that "Only those species that are known to occur in the SEZ regions are discussed in Appendix J because the need for an expanded species analysis by alternative was identified too late in preparation of the Draft PEIS to be accommodated in

this version of the document. It is anticipated that a discussion of all species with potential for impacts under each alternative will be developed between the Draft and Final PEIS." DEIS at RG-8. How could the BLM not be aware of the need to consider the impacts of its proposed action on threatened and endangered species?

Alternative (3) the SEZ alternative is the DPEIS' "Goldilocks alternative". Unfortunately, although it purports to restrict solar power plant development to the designated SEZ, this SEZ alternative is effectively the same as the proposed action since BLM can expand, add, remove, or reduce SEZs in the future.

NEPA requires agencies to rigorously explore and objectively evaluate all reasonable alternatives. BLM's analysis of a limited number of similar alternatives makes this a grossly inadequate range of alternatives.

The BLM has not considered the following alternatives:

(A) A climate change alternative that would exclude all public lands from solar energy development to provide maximum flexibility and opportunity for species and their habitats to survive climate change impacts;
(B) An alternative that would use presence of an endangered, threatened or candidate species as an exclusion in the screening criteria so that SEZ are not designated on habitat for endangered, threatened or candidate species;
(C) An alternative that constrains the range of technologies that could be used, to promote technologies that minimize water use and environmental footprints;
(D) An alternative that focuses development on private land; and,
(E) A distributed energy alternative.

These five alternatives would promote responsible energy production, would minimize or avoid impacts to sensitive resources, and would protect and enhance the Nation's water, wildlife, and other natural resources. BLM has ignored or unfairly dismissed these alternatives.

3. IMPACTS OF SOLAR ENERGY DEVELOPMENT AND POTENTIAL MITIGATION MEASURES

FLPMA § 201 [43 U.S.C. 1711] (a) requires the Secretary to prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values (including, but not limited to, outdoor recreation and scenic values), giving priority to areas of critical environmental concern. This inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values."

Despite this inventory requirement, the BLM states in the DPEIS that for its preferred alternative it was unable to obtain complete geographic information system (GIS) data across the six-state study area and thus could not map the exact footprint of the alternative nor calculate the exact acreage. DPEIS at 2-3. It has compounded this by failing to provide a quantitative analysis

of the cumulative effects of the preferred alternative on listed and candidate species. These obvious, gross deficiencies need to be rectified.

Based on data in Tables 2.2-1 and ES 2-1, the approximate areas by alternative are:

State	Total State	BLM-Administered lands (Acres)		
	Acreage	No Action	Preferred Alternative	SEZ Alternative
Arizona	72,700,000	9,218,009	4,485,944	13,735
California	100,200,000	11,067,366	1,766,543	339,090
Colorado	66,500,000	7,282,061	148,072	21,050
Nevada	70,300,000	40,794,055	*9,084,050	171,265
New Mexico	77,800,000	12,188,361	4,068,324	113,052
Utah	52,700,000	18,182,368	2,028,222	19,192
Total	440,200,000	98,732,220	21,581,154	677,384

*The estimate for Nevada given in Table ES.2-1 is 9,587,828; we do not know which is the BLM's actual estimate.

The scale of the permanent degradation and loss of the public lands and public resources that could result from this PEIS process is unprecedented.

BLM is obligated under FLPMA to "minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values (including fish and wildlife habitat) of the public lands involved." 43 U.S.C. §1732(d)(2)(a). Other laws, including the Endangered Species Act, also entail the need for mitigations to minimize impacts. BLM is required to consider measures to mitigate potential environmental consequences in its NEPA analysis. 40 C.F.R. § 1502.16. The NEPA implementing regulations define "Mitigation" to include:

> (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
> (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
> (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
> (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
> (e) Compensating for the impact by replacing or providing substitute resources or environments.
> [40 C.F.R. §1508.20]

The scale of the degradation and the potential massive loss of public resources will make development of appropriate mitigation measures extremely costly and difficult. All of the mitigation measures outlined in §1508.20 are applicable to various aspects of solar energy development.

In order to minimize adverse impacts, the BLM should drop many of the proposed study areas from further consideration as Solar Energy Zones. The BLM's siting approach, based on

slope, proximity to utility corridors (which invariable pass through valleys and over bajadas) and existing land use designations has effectively resulted in the targeting of desert tortoise habitat in California, Nevada, and Arizona. The BLM's preferred alternative opens 12 percent of "desert tortoise" habitat to solar development. DPEIS at ES-21. That BLM is even willing to entertain opening up 12 percent of the habitat of any listed species is problematic; that fact that this is the BLM's preferred action is simply outrageous. BLM should reconsider its siting criteria to promote avoidance of listed species.

Section 5.10.5.1 Siting and Design must be modified to include a requirement to avoid species habitat that provides important connectivity between populations, and to avoid habitat that provides important corridors for wildlife movement. Without this, the DPEIS will need to undertake an extensive analysis of impacts to habitat connectivity for all special status species.

High quality Mojave Desert shrublands and high quality sagebrush habitats or those that have good restoration potential should not be developed for solar energy in areas where ESA listed or candidate species and other Special Status Species or rare species occur. This applies in particular to desert tortoise, greater sage-grouse, and Gunnison sage-grouse which require landscape level conservation measures to promote recovery.

In order to compensate for the enormous habitat losses, and the additional direct, indirect, and cumulative impacts to sensitive resources caused by the presence of solar power plants and associated infrastructure, the acquisition of off-site compensation lands will be needed and the BLM will need to reduce the multiple impacts of all other consumptive uses authorized by any given land use plan. The BLM should use the PEIS to modify all subject land use plans to allow voluntary buyout of grazing permits. This would then provide a win-win situation for the developers and permittees. Developers could use buyout to offset site-specific impacts from their projects on wildlife, sensitive species, riparian zones, and other resources; permittees who would have their grazing privileges restricted would benefit from the ability to cash out. The ecological benefits of retiring allotments are high and this action may be easier to accomplish than other proposed management solutions. Livestock grazing is a landscape level impact, and the action area for livestock impacts tends to very large with a footprint indicated by the size of the allotment itself. Removing livestock removes direct and indirect impacts at a landscape level as well as reducing impacts on specific, sensitive resources such as riparian areas, cultural sites, and sensitive species and rare plant habitats. Removal of livestock benefits wildlife by removing negative interspecies interactions, reducing competition for forage, and reducing the risk of spread of invasive plants. Combined with the removal of range improvements, this measure would also help reduce the impacts of other threats such as OHV activities and unauthorized route use by eliminating "attractive nuisances", and would reduce subsidized predators such as ravens and coyotes that use those range improvements. It would also reduce trampling impacts to biological crusts and allow allotment lands to reach full potential as carbon sinks, thus helping to offset the loss of carbon sequestration from utility-scale developments. After the initial buyout, it would potentially reduce BLM costs associated with rangeland management and administration.

A combination of both acquisition of compensation lands and an overall reduction of impacts will be required to achieve a net decrease in cumulative impacts to sensitive and listed species to offset the habitat loss and other impacts,.

In addition, the Mojave Desert acts as a carbon dioxide sink on a par with grasslands and temperate forests.[1] In order to assure a net climate change benefit, the BLM should require that all solar energy projects demonstrate a clear net carbon dioxide reduction benefit. The loss of the project sites carbon dioxide sink capability should be factored into the mitigation calculations. Any requirement for the operation of gas-powered or other fossil fuel power plants to accommodate loads etc should also be factored into the calculation.

The BLM should clearly adopt a policy of "no net loss" of public lands whereby an equivalent acreage of private lands and inholdings are acquired by project developers and these compensation lands are conserved in perpetuity. Habitat quality of compensation habitat must be of an equal or better quality than the habitat lost to solar projects. This would protect and mitigate for impacts for common desert flora and fauna, and would be in addition to any habitat acquisition required to offset impacts to special status species.

4. IMPACTS AND CUMULATIVE EFFECTS

The National Environmental Policy Act ("NEPA") requires agencies to take a "hard look" at the potential environmental impacts of its proposed actions. The PEIS must fully consider the direct, indirect and cumulative effects of the proposed policy and actions. Further, NEPA directs agencies to "rigorously explore and objectively evaluate all reasonable alternatives" [40 C.F.R. 1502.14] A consideration of alternatives that lead to similar results is not sufficient to meet the intent of NEPA. The PEIS must address all substantial questions raised by the public. The PEIS should present the environmental impacts of the proposal and the alternatives in comparative form based on the information and analysis presented in the sections on the Affected Environment (40 C.F.R. § 1502.15) and the Environmental Consequences (40 C.F.R. § 1502.16). This more sharply defines the issues, provides a clear basis for choice among options by the decisionmaker and the public, and ensures that the choice not be arbitrary and capricious.

Emissions and Climate Change Effects

The DPEIS repeatedly states or implies that the use of solar facilities to generate electricity "would displace air emissions that would otherwise be released from fossil fuel-fired power plants." DPEIS at 8.1-163. There is no support in the DPEIS or elsewhere for this statement; the solar power plants proposed in the preferred alternative are apparently *in addition to*, not *in lieu of*, fossil fuel energy generation. Nowhere does the DPEIS discuss the fossil fuel-fired power plants that will be displaced by the construction of the proposed industrialized, decentralized solar power plants proposed here. Even if solar power plants were to displace coal fired plants, additional power generation or extensive storage facilities would be needed to offset

[1] Wohlfahrt, G., Fenstermaker, L. F. and Arnone, J. A. III. 2008. Large annual net ecosystem CO2 uptake of a Mojave Desert ecosystem. Global Change Biology. 14(7): 1475-1487.

the imbalance between solar electric generation which is sunlight dependent and actual demand for power. The DPEIS does not explain how many new fossil-fuel power plants (and their emissions output) will be needed to ensure continuity of energy generation to match consumption.

Effects on Wildlife and Special Status Species

The DPEIS does not take the requisite hard look at impacts to the wildlife, vegetation, and threatened and endangered species in the massive action area for the preferred alternative. This is a major omission that merits recirculation of the DPEIS.

DESERT TORTOISE

The BLM's preferred alternative opens 12 percent of "desert tortoise" habitat to solar development. DPEIS at ES-21. First, this statement does not distinguish between the listed *Mojave* desert tortoise population and the candidate *Sonoran* desert tortoise. Second, this habitat consists largely of the essential matrix habit that connects desert tortoise populations and conservation areas. Third, this habitat includes peripheral desert tortoise populations that may be important in the species' response to climate change. Thus decisions made in this PEIS process could have highly significant consequences for both these taxa. Despite the requirements to do so, the PEIS does not provide quantitative estimates of the size of the impacted population. This is particularly problematic given the BLM's recent need to re-initiate consultation with te USFWS over impacts to desert tortoise at the Ivanpah Solar Electric Generating System project where it seriously underestimated the number of affected tortoises.

Mojave desert tortoises, listed as threatened under the ESA, occur in the affected areas of the following 8 SEZs: Amargosa Valley, Delamar Valley, Dry Lake, Dry Lake Valley North, East Mormon Mountain, Iron Mountain, Pisgah, and Riverside East. Sonoran desert tortoises, candidate species for ESA listing, may occur in the affected areas of the following 3 SEZs: Brenda, Bullard Wash, and Gillespie. These SEZ will directly impact desert tortoises in at least four of the six Recovery Units identified in the 1994 Recovery Plan[2], and may seriously compromise connectivity and gene flow between the Evolutionarily Significant Units of desert tortoise that occupy them.

The BLM needs to analyze the cumulative effects of development on desert tortoise for each alternative. It needs to determine the affected population size, fully analyze the cumulative effects of fragmentation, and fully analyze the impacts to connectivity between desert tortoise genetic units and between desert tortoise conservation areas. Unless additional safeguards are built in, we do not see how the USFWS will be able to avoid issuing a jeopardy finding over impacts to desert tortoise.

GOLDEN EAGLE

[2] Fish and Wildlife Service. 1994. Desert Tortoise (Mojave Population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. 73 pages plus appendices.

Golden eagle (*Aquila chrysaetos*) is a fully protected species under The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). The USFWS currently does not issue "take" permits for this species because the species is declining. Loss of foraging habitat that results in a decrease in productivity or nest abandonment is considered "take". The DPEIS recognizes that golden eagles use many of the solar power development areas including most of the proposed SEZ as foraging areas.

McCrary et al. 1986[3] studied a small, prototype thermosolar facility. They found that bird mortality occurred through collisions with structures such heliostats and from burning when birds flew through points where energy was focused from the heliostats. They cautioned that "Since Solar One is only a 10 megawatt pilot facility, future project designed to produce hundreds of megawatts will require several thousand heliostats and much taller receiver towers. The greater magnitude of these facilities may produce non-linear increases in the rate of avian mortality when compared to Solar One and extrapolations from this study should be made with caution. The removal of large tracts of desert from biological production for solar power generation and the ecological effects caused thereby should also be of concern." Given the large areas that may be developed, the range of technologies, and the existing database we believe that there is ample information regarding the potential risk to golden eagles, and believe that this program will take golden eagles. BLM should propose avoidance of any take by restricting the areas open to development and by restricting the technologies used to those that do not require structures that may place eagles at risk.

GREATER SAGE-GROUSE & GUNNISON'S SAGE-GROUSE

High quality sagebrush habitats or those that have good restoration potential should not be developed for solar energy in areas where greater sage-grouse and Gunnison sage-grouse occur because these species require landscape level conservation measures to promote their recovery. The cumulative effects analysis does not quantify the impacts to the species populations, nor does it provide a quantitative analysis of the cumulative effect of the transmission lines and fences, and access roads that will be engender by each alternative. These deficits must be addressed.

FISH & AQUATIC SPECIES

Many aquatic species will be affected or may be affected by water drawdown and by water use. However, there is no analysis of the cumulative impacts of water use on fish and wildlife and their habitats within each SEZ.

Livestock Grazing

The DPEIS proposes "Wherever there are reductions in grazing use, opportunities for mitigating this loss through changes in livestock management or installation of range improvements should be considered." DPEIS at 5-12. There is no analysis of the cumulative effects of this proposal on sensitive resources including wildlife.

[3] McCrary, M. D., McKernan, R. L., Schreiber, R. W., Wagner ,W. D. and Sciarrotta, T. C. 1986. Avian Mortality at a Solar Energy Power Plant. Journal of Field Ornithology. 57(2): 135- 141.

Water Resources

Water is one of the most precious desert resources, and maintaining surface waters and flows, and ground water supplies is essential for conserving desert ecosystem function. Developing large tracts of land for solar power plants impact surface waters and groundwater. Many of the desert basins are already in a serious water overdraft situation and the entire western United States is facing serious water shortages under all climate change scenarios. It is critical that the BLM ensures that solar development does not allow unacceptable impacts to both the quantity and quality of water resources and the ecosystems, habitat and species that depend on them. The BLM should require that any water needs for authorized power plants be completely offset by reductions in other uses within the basin.

The DPEIS analysis of the risks of hydrological disruption posed by large-scale power plants is inadequate. The DPEIS should include uniform mitigation and monitoring measures for the ephemeral washes on the public lands. The ecological condition of these washes is extremely important for multiple reasons, including the hydrologic health of the watershed (infiltration, erosion, downstream water quality), biodiversity (migratory corridors and habitats), and vegetation (the majority of vegetation occurs alongside of these supplemental water sources). In some states, such as California, state agencies assert jurisdiction and require mitigation for impacts to ephemerals streambeds. However, this is not true in Arizona. The BLM must require full mitigation in the form of purchase of replacement ephemeral streambed habitat.

5. CALIFORNIA PROPOSED SOLAR ENERGY ZONES

California gets the lion's share of the acreage of the proposed solar study areas. The maps depict four study areas within the FLPMA designated California Desert Conservation Area: Imperial East (12,830 acres), Iron Mountain (109,642 acres), Pisgah (26,282 acres), and Riverside East (202,295 acres). The maps also depict vast tracts of land sweeping across the Mojave and Colorado Deserts that are lands being considered open development in the DPEIS preferred alternative.

Development of these four solar study areas would result in a massive loss of habitat, major fragmentation of entire desert ecosystems and loss of connectivity. This is clearly incompatible with the purpose of the California Desert Conservation Area espoused in FLPMA, which is "to provide for the immediate and future protection and administration of the public lands in the California desert within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality". Contrary to the BLM's goal of facilitating siting of solar power plants, the proposed SEZ themselves are located in relatively resource rich locations. This makes them both controversial and inappropriate.

There is a considerable amount of solar energy power plant development already underway in California with 19,100 MW on public lands within the CDCA alone, and the goal of 10,000 MW mentioned in the Energy Policy Act and Secretarial orders has clearly been exceeded. Given the large amount of public land which is already slated for development for

solar power plants in California, the BLM should readdress its purpose and need, and reconsider the need for locating any Solar Energy Zones in the state.

Comments Specific to the Proposed Imperial East SEZ (California)

The proposed Imperial East SEZ includes 5,722 acres of public land. It is located in Imperial County in southeastern California, near the United States–Mexico border between I-8 and State Route 98, and just north of the All-American Canal.

We do not support the designation of the Imperial SEZ. There are multiple conflicts with cultural resources and wildlife and habitat resources associated with this proposed SEZ. It is located immediately east of a cultural ACEC (Lake Cahuilla – C) and immediately southwest of East Mesa ACEC.

Existing transmission lines in the area are inadequate to deal with the assumed output and "upgrades of existing transmission lines would be required to bring electricity from the proposed Imperial East SEZ to load centers; however, at this time the location and size of such new transmission facilities are unknown." DPEIS at 9.1-3.

Cultural Resources: The Imperial East SEZ lies between Lake Cahuilla cultural ACECs C and D and is an area rich in important cultural resources. According to the DPEIS, "One archaeological survey has been conducted within the Imperial East SEZ in the northwest corner of the SEZ." The size of this surveyed area is not provided but appears cover only a small proportion of the SEZ. The DPEIS recognizes that Lake Cahuilla ACECs C and D could be exposed to additional human traffic, resulting in an increased risk of loss of prehistoric resources. DPES at 9.1-6. The Specific Design Feature to deal with this issue is: "Once construction of solar energy facilities begins, the BLM would monitor to determine whether increases in traffic in the ACECs occurs and whether additional management measures are required to protect the resources in these areas." This is inadequate since it only monitors for impacts. The emphasis should be on avoidance. The BLM should survey the entire SEZ for cultural significance prior to making any decision to designate this SEZ. It should establish clear measures to avoid any impacts to the adjacent and nearby ACECs.

Yuma Clapper Rail: The proposed Imperial East SEZ is immediately north of a "wetland" mitigation north of the All American Canal area that provides a nesting location for the endangered Yuma clapper rail (CNDDB occurrence 17). The proposed SEZ includes 44 acres of potentially suitable habitat for the species. The Yuma clapper rail is a California fully protected species. This means that state agencies cannot issue take permits for the species. The SEZ area boundary should be altered to exclude actual and potential Yuma clapper rail habitat and to provide an appropriate buffer to eliminate potential impacts on the local hydrology.

Flat-tailed Horned Lizard: The proposed Imperial East SEZ includes significant amounts of occupied flat-tailed horned lizard habitat. The proposed SEZ falls within the BLM's designated East Mesa Flat-tailed Horned Lizard Wildlife Habitat Management Area and is adjacent to the East Mesa ACEC. The DPEIS estimates that development of this SEZ will have indirect impacts on 9.0% of available potentially suitable habitat in the region. DPEIS at 9.1-133.

The USFWS's recent decision to withdraw its proposed listing decision for the Flat-tailed horned lizard relied in part on the assumption that "the overall acreage of potential impacts from development of energy facilities is likely to be small compared to the total range of the species". FWS 2011[4] at 14228. Designation and development of this SEZ will clearly jeopardize this USFWS assumption. The proposed Imperial East SEZ boundaries should be reconfigured to avoid impacts to the flat-tailed horned lizard or the proposed SEZ should be abandoned.

Bighorn Sheep: The proposed Imperial East SEZ includes bighorn sheep habitat. According to the DPEIS (at 9.1-105), "Because it is a BLM sensitive species, the desert bighorn sheep is discussed in Section 9.1.12." However, there is no mention of bighorn sheep in section 9.1.12 let alone any discussion. Nor are bighorn sheep discussed anywhere else in the proposed Imperial East SEZ write-up with the exception of a mention in the cumulative effects section (DPEIS at 9.1-287) that projects may block bighorn sheep dispersal corridors. This inadequacy needs to be rectified.

Golden Eagle: The DPEIS recognizes that the fully protected golden eagle (*Aquila chrysaetos*) may forage on the proposed Imperial East SEZ. The USFWS currently does not issue "take" permits for this species because the species is declining. Loss of foraging habitat that results in a decrease in productivity or nest abandonment is considered "take". Required upgrades to existing transmission lines may exacerbate the risks of take.

Because there are multiple conflicts with cultural resources and wildlife and habitat resources associated with this proposed SEZ, BLM should withdraw the proposed Imperial East SEZ from further consideration.

Comments Specific to the Proposed Iron Mountain SEZ (California)

The proposed Iron Mountain SEZ includes 106,522 acres of public land. It is located in San Bernardino County in southeastern California in Ward Valley between an ACEC, the Chemehuevi Desert Wildlife Management Area (DWMA), and state highway 62.

We do not support the designation of the Iron Mountain SEZ. There are multiple conflicts with wildlife and habitat resources associated with this proposed SEZ. It is located immediately south of the Chemehuevi DWMA and provides patches of desert tortoise habitat that provide the connectivity between the Northern and Eastern Colorado Desert Tortoise Recovery Units. It is also habitat for several rare plants including multiple occurrences of Harwood's eriastrum and Harwood's milkvetch. Large-scale clearance and engineering construction within this site will severely disrupt essential hydrological processes.

The proposed SEZ includes the southern swathe of Ward Valley, well known to the public from the long-running controversy over the nuclear waste facility that was once proposed there. Northern Colorado Recovery Unit desert tortoise populations, bighorn sheep, raptors, hepatic tanager, rare plants including Harwood's eriastrum, and important cultural resources would be directly and indirectly impacted by any power plant projects in this area.

[4] FWS. 2011. Endangered and Threatened Wildlife and Plants; Withdrawal of Proposed Rule To List the Flat-Tailed Horned Lizard as Threatened. Federal Register. 76(50): 14210- 14268. Tuesday, March 15, 2011.

The proposed Iron Mountain SEZ overlies the Chocolate Mountains - Turtle Mountains - Ward Valley connectivity area, an essential habitat connectivity linkage which provides habitat for species occupation and movement between ecotypes in the region (Spencer *et al*., 2010). It provides important connectivity and linkage matrix for the desert tortoise, bighorn sheep and other species.

Since designation of the proposed Iron Mountain SEZ is opposed by many state agencies including the California Energy Commission we do not understand why the BLM has continued to waste public resources and not dropped the proposed SEZ from further study. Because there are multiple conflicts with cultural resources and wildlife and habitat resources associated with this proposed SEZ, BLM should immediately withdraw the proposed Iron Mountain SEZ from further consideration.

Comments Specific to the Proposed Pisgah SEZ (California)

The proposed Pisgah SEZ includes 23,950 acres of public land. It is located in San Bernardino County in southeastern California, about 100 mi (160 km) northeast of Los Angeles. The proposed Pisgah SEZ would be sandwiched between two ACECs, the Ord-Rodman DWMA to the west and the Pisgah ACEC to the east, and the Cady Wilderness Study Area to the north.

We oppose the designation of the proposed Pisgah SEZ. This is a resource rich area and there are multiple resource conflicts which make this area highly unsuitable as a SEZ. Desert tortoise, bighorn sheep, Mojave fringe-toed lizard, raptors, rare plants including white-margined beardtongue, small flowered androstephium and Emory's crucifixion-thorn, other sensitive species and cultural resources would be directly and indirectly impacted by utility-scale projects. A recent study has cautioned identification of this area because of multiple impacts to desert tortoise and bighorn sheep movement.[5] The SEZ is adjacent to known pockets of high desert tortoise density, and this area provides the only connectivity between tortoises in the Southern Mojave and Central Mojave populations as identified by Murphy et al, 2007[6], and it will impact connectivity between the West Mojave Recovery Unit and the eastern desert tortoise recovery units. The site is immediately adjacent to two ACECs and a Wilderness Study area, and includes part of the Pisgah Lava Flow Research Natural Area. Large-scale clearance and engineering construction within this site will severely disrupt essential hydrological processes. For all these reason, this sensitive and significant area should be removed from further consideration as a Solar Energy Zone.

Because there are multiple conflicts with cultural resources and wildlife and habitat resources associated with this proposed SEZ, BLM should immediately withdraw the proposed Pisgah SEZ from further consideration.

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[5] Bare, L., Bernhardt, T., Chu, T., Gomez, M., Noddings, C. and Viljoen, M. 2009. Cumulative Impacts of Large-scale Renewable Energy Development in the West Mojave. Effects on habitat quality, physical movement of species, and gene flow. Masters Thesis. University of California, Santa Barbara. 144 pp. *Available at*: http://fiesta.bren.ucsb.edu/~westmojave/images/Wemo_Final.pdf

[6] Murphy, R. W., Berry, K. H., Edwards, T. and Mcluckie, A. M. 2007. A Genetic Assessment of the Recovery Units for the Mojave Population of the Desert Tortoise, *Gopherus agassizii*. Chelonian Conservation and Biology 6(2): 229–251.

Comments Specific to the Proposed Riverside East SEZ (California)

The proposed Riverside East SEZ is the largest of the proposed SEZs in the six-state study area, with a total area of 202,896 acres. It sprawls along Interstate 10 from the Joshua Tree National Park/Desert Center area to Blythe, California.

There are multiple resource conflicts at this site in part because the study site is extremely large and ranges across the heart of California's Colorado Desert region.

We oppose the designation of the proposed Riverside East SEZ. The northeastern portion includes extensive occupied desert tortoise habitat. The entire polygon effectively divides the Northern Colorado Desert Tortoise Recovery Unit from the Eastern Colorado Desert Tortoise Recovery Unit, and development thus threatens to sever connectivity entirely. The proposed study area also includes bighorn sheep, raptor, and sensitive bat habitats, and would impact many rare plant species including Coachella valley milkvetch, jackass clover at Palen Lake, and Harwood's milkvetch. There are important cultural sites particularly those associated with the dry lakes. The polygon also includes Ford Dry Lake and development would impact off-road vehicle use. A number of ACECs are entirely surrounded and isolated by the proposed SEZ. Large-scale clearance and engineering construction within this site will severely disrupt essential hydrological processes.

Because there are multiple resource conflicts with this sprawling proposed SEZ, the BLM should remove this area from further consideration as a Solar Energy Zone.

6. ARIZONA PROPOSED SOLAR ENERGY ZONES

The BLM's preferred alternative opens 7,009 square miles of land in Arizona to solar development, an area 326 times the size of the SEZ-designated lands. DPEIS at ES-6, Table ES.2-1. No other state has such a large percentage of total BLM acres open to solar development as Arizona under the preferred alternative (49 percent), nor such a great disparity between the SEZ alternative and the preferred alternative.

The BLM anticipates that 214,000 acres will be developed within the next 20 years under the reasonably foreseeable development scenario (RFDS). DPEIS at ES-14. This is well within the SEZ acreage of 677,384 acres. DPEIS at ES-6, Table ES.2-1. It is therefore entirely unclear why the BLM's preferred alternative entails opening over ten times the amount of land necessary for solar development under its own projections; the ratio of land under the SEZ alternative meets the criteria the BLM specifies for the preferred alternative, that is "adequate amounts of land available to support the level of development projected in the RFDS and would provide a great deal of flexibility in siting both solar energy facilities and associated transmission infrastructure." DPEIS at ES-29. There is no justification as to why the BLM needs to designate so many acres as open to power plant development.

The SEZ-specific design features for the Arizona SEZs include the development of additional range infrastructure and changes to grazing management to mitigate the loss of AUM that may be associated with the solar developments. Range "improvements"/developments need a separate NEPA process to ensure against adverse effects.

We are concerned with the estimated fresh surface water and groundwater use the solar developments would entail. Arizona is facing serious water shortages under all climate change scenarios, including a tenuous allocation from the Colorado River. Allocating potable water for solar development, either through allowing surface water transfers or groundwater pumping, is giving away precious public trust resources for private development. We do not believe that the DPEIS does an accurate or thorough analysis of the risks of hydrological disruption the proposed action poses to Arizona's public lands. The threats of drawdown are too easily dismissed in the DPEIS. See, for example, DPEIS at 8.1-62. Overdraft in the Brenda SEZ groundwater basin has already caused substantial ecological and geologic impacts from subsidence. If the BLM were proposing to allow solar development on existing in-holdings, urban-adjacent lands, or other areas that might already have infrastructural support for it, the agency could be requiring the use of non-potable water (effluent) in the generation of these "renewable" energy supplies. Given the slow rate of aquifer recharge, we don't believe that the current proposals are truly "renewable."

The DPEIS should be amended to reflect the current status of the Sonoran desert tortoise which is a candidate species for listing. 75 FR 78094-78146, December 14, 2010. The USFWS specifically identified the disturbance anticipated by the Sterling Solar Generating Facility, a solar development not included in the DPEIS and apparently not considered in the reasonable foreseeable development scenario on the Black Mountains desert tortoise population. The USFWS determination that the Sonoran desert tortoise warranted listing discussed the threats from new transmission lines and roads from solar development. The FWS makes plain that solar developments, combined with other threats in the species habitat, makes Sonoran desert tortoise eligible for endangered species status. In the finding, the agency acknowledges that new threats may elevate the species for full ESA protection. We believe that if the BLM goes forward with the locations listed in the DPEIS for Arizona, this alone may compel full listing of this taxon.

The BLM relies up the implementation of programmatic design features to reduce impacts to special status species and, presumably, finds these suitable reductions in the threat to Sonoran desert tortoise as well. However, desert tortoise is a highly mobile species, known to move across large distances and between mountain ranges. *See* Connor and Rosmarino, 2008. Thus, even if the solar installations are not directly on top of tortoise burrows, the impacts within the habitats of this species cannot be dismissed.

While the DPEIS minimizes the scale of the impacts to the Sonoran desert tortoise by isolating the acreage at each SEZ, it is important to acknowledge the range-wide threats this species faces, including the cumulative effects of solar development at other SEZs and on other solar project sites. Where the BLM discusses compensatory mitigation by improving habitats on acquired lands, we propose the agency consider retiring grazing allotments and reducing this known adverse effect in tortoise habitat.

The DPEIS does not include mitigation or monitoring measures for the ephemeral washes on the public lands proposed for development. The ecological condition of these washes is extremely important for multiple reasons, including the hydrologic health of the watershed (infiltration, erosion, downstream water quality), biodiversity (migratory corridors and habitats), and vegetation (the majority of vegetation occurs alongside of these supplemental water sources). Because the Arizona BLM does not measure or monitor rangeland health attributes in washes, the downstream impacts of the SEZ developments will go unquantified and unmitigated. The BLM must simultaneously develop land health standards and practices that will capture any consequences of the solar developments, with baseline data on the ephemeral wash environment collected before any development takes place. See, for example, the wetlands on the Bullard Wash SEZ; the ecological health of these important habitats would not be monitored under any existing monitoring protocols employed by the BLM. DPEIS at 8.2-68.

Comments Specific to the Proposed Brenda SEZ (Arizona)

The SEZ-specific design features for the Brenda SEZ in Arizona include the development of additional range infrastructure and changes to grazing management to mitigate the loss of AUM on the Crowder-Weisser allotment. DPEIS at 8.1-5. As we suggested in our earlier comments, the BLM should have considered simply allowing for relinquishment of those AUM as well. This is especially pertinent because the Crowder-Weisser allotment provides habitat for the Sonoran desert tortoise, a species that would be adversely affected by additional range developments and grazing concentration areas. By range "improvements," the agency usually means additional water supplies, a cumulative impact that the DPEIS fails to analyze at this SEZ location. DPEIS at 8.1-7.

The DPEIS hints at potential compensatory mechanisms to balance acreage of habitat loss but does not commit to a mitigation program for the solar proposal. DPEIS at 8.1-148. It suggests improving the carrying capacity for tortoise on acquired lands or enhancing tortoise habitat on federal land, but it does not commit to any clear course of action to do so. The proposed action should have specific offsets and actions identified if the BLM expects the public to have any faith in these mitigation measures. For example, the BLM could have used the PEIS to modify all land use plans to allow voluntary buyout of grazing permits

The DPEIS posits a reduction in 315 AUM from the Crowder-Weisser allotment due to the footprint of the Brenda SEZ. DPEIS at 8.1-29. The DPEIS discusses absorption of the AUM on other parts of the vast acreage associated with this allotment. The DPEIS should acknowledge, and the BLM should clarify, that earlier assessments of the rangeland health of this allotment have specifically indicated, "The public lands [of the allotment] do not regularly produce sufficient amounts of forages to sustain a consistent livestock grazing program throughout the allotment." Crowder-Weisser Standards and Guidelines Assessment. The active use on the allotment has been substantially lower than the permitted use for this reason. Therefore, the proposed action should be to simply eliminate the acreage associated with the solar development and adjust the AUM on the permit to the actual forage remaining on the allotment.

We're concerned about the "should" statements in the SEZ-specific design features tables (e.g. "Bouse Wash should be avoided… Tyson Wash should be spanned by the transmission line," DPEIS at 8.1-9). Because these are supposed to be mitigation measures for reducing the impact of solar development on wildlife resources, the DPEIS must use imperative language ("will" and "shall") to make these hard and fast commitments. Without this, the mitigation measures promised in the DPEIS are merely suggested remedies and the contingent effects analysis is meaningless.

We note that the DPEIS only assesses the impact of the acoustic environment on the human communities surrounding the Brenda SEZ. DPEIS at 8.1-14. It does not consider the acoustic impacts of the proposed developments on the native and migratory wildlife species of the region, an oversight that must be remedied before the final EIS. The sonic considerations are not even addressed in the species-specific analysis later in the chapter. See, for example, DPEIS 8.1-152.

In our scoping comments, we specifically raised the issue of invasive species infestation in the Brenda SEZ. The DPEIS does not respond specifically, but generally describes, "Noxious weeds could become established." DPEIS at 8.1-8. This ignores the site-specific information that problematic invasive weeds are already there. The DPEIS reports that no noxious weeds are present on the Brenda SEZ (DPEIS at 8.1-72) but does not consider whether weeds are nonetheless present, including *Brassica tournefortii*, a highly flammable and invasive pest plant. Moreover, while BLM does not report these species being on the proposed SEZ in August 2009, it does not describe whether they are present on the proposed transmission line footprint or within the cumulative impact area.

The DPEIS claims that there are no ground-disturbing activities associated with the project developments within the area of indirect effects. DPEIS at 8.1-146. This disregards the effects of hazardous waste spills travelling through the soil, affecting biological soil components, reductions to soil integrity and stability.

Section 8.1.11 of the DPEIS describes the impacts to wildlife and aquatic biota that could occur with the potentially affected area of the proposed Brenda SEZ. DPEIS at 8.1-79. We find it remarkable that the same justification is provided for nearly every species that the BLM considers: "Small overall impact." The reality is, cumulatively, the impact will be profound within the area that the SEZ is located, likely the complete obliteration of suitable habitat for many dozens of species and hundreds of individuals. The DPEIS should not minimize but rather disclose the extent and intensity of the proposal.

It is not clear from the DPEIS whether the BLM has considered the cumulative impacts of the Brenda SEZ in context of the "Quartzsite Solar Energy Project" in La Paz County, Arizona. The Quartzsite project was scoped in January 2010, and it is also located on a section of the Crowder-Weisser allotment very near to the proposed SEZ. The potential for this additional (and undescribed in the DPEIS) development in the same area is a present and reasonably foreseeable future action that should have been analyzed and disclosed. The Quartzsite project is likely to have serious visual impacts (given the extent of proposed infrastructure) and cumulative effects on wildlife species in the area.

Comments Specific to the Proposed Bullard Wash SEZ (Arizona)

The Bullard Wash SEZ is in a remote desert area, with the nearest major road approximately 5 miles away to the south and the nearest transmission line 5 miles to the north of the SEZ. DPEIS at 8.2-1. The extent to which this area has already been impacted by human activities is unspecified, but its remoteness and inaccessibility make it an inappropriate site for new, industrial development. The BLM should have considered lands that are already along roadway corridors or transmission lines in order to minimize the footprint of the solar development.

The Bullard Wash SEZ is situated in an area recognized for its remoteness and inaccessibility, as signified by the high number of Wilderness Areas and Areas of Critical Environmental Concern in the surrounding public lands. DPEIS at 8.219. The experience of visitors to these places and the integrity of the habitats for non-human species reflect the lack of industrialized landscapes, exactly the opposite of what the BLM is now proposing. The BLM must commit to limiting types of solar development at this SEZ to those which would not impact the viewshed. DPEIS at 8.2-21. Moreover, the experience of Wilderness is not only visual, but a feeling of solitude that cannot be calculated in spatial analysis. BLM has not conducted a social assessment to determine these impacts to human experience of the natural environment.

We note that the DPEIS only assesses the impact of the acoustic environment on the human communities surrounding the Bullard Wash SEZ. DPEIS at 8.2-14. This does not consider the acoustic impacts of the proposed developments on the native and migratory wildlife species of the region, an oversight that must be remedied before the final EIS. The sonic considerations are not even addressed in the species-specific analysis later in the chapter.

The Bullard Wash SEZ occurs on three perennial/ephemeral grazing allotments. DPEIS at 8.2-27. Similar to the Brenda SEZ, the BLM cannot posit a ratio-based reduction in AUM on these allotments scaled to acreage lost; desert vegetation is extremely patchy and a new "carrying capacity" estimate would need to be done before grazing is reauthorized on the newly-demarcated boundaries of each allotment. Where the DPEIS says, "Quantification of the impact on the grazing permittees would require a specific analysis..." (DPEIS at 8.2-28) it should more appropriately read, "A new EIS will be completed to determine a range of alternatives for the downsized allotments."

The calculations of the impacts to groundwater inflows from the Bullard Creek SEZ's groundwater basin from solar development are an issue not just for the geological stability of the area (subsidence), but because the contribution of groundwater to the nearby surface waters of the Havasu Lake and Bill Williams river also relates to the extent of riparian habitat available for imperiled species. The DPEIS does not address these "downstream" impacts of the proposed solar development. DPEIS at 8.2-64. Stating that withdrawals "should" be limited to prevent impacts to riparian areas is insufficient protection for these special habitats. DPEIS at 8.2-80.

Comments Specific to the Proposed Gillespie SEZ (Arizona)

The Gillespie SEZ is described in the PEIS as "undeveloped and rural" and "undeveloped scrubland characteristic of a semiarid desert valley." DPEIS at 8.3-1. The proposed action would completely change the description of this landscape, converting the undeveloped character to an industrialized power generation station, permanently stripping these lands of their rural and desert valley character.

We note that the map included in the DPEIS does not address the designation of the nearby BLM lands. DPEIS at 8.3-2. The lands to the east to the east of the SEZ are within the Sonoran Desert National Monument, a place so special and remarkable that it was so designated in 2001. The proclamation describes this area as having "an extraordinary array of biological, scientific, and historic resources. The most biologically diverse of the North American deserts…. excellent habitat for a wide range of wildlife species." Surely, the BLM does not expect the public to believe those values stop at the arbitrary boundaries of the monument? The Gillespie SEZ and the surrounding public lands are equally important to the ecological integrity of the region.

The DPEIS discusses mitigating the loss of 14.6 percent reduction in future ephemeral grazing authorizations in the Layton allotment as a result of development in the Gillespie SEZ. Table 8.3.1.3-1. It is unclear how the BLM determined this reduction; carrying capacity is not arbitrarily determined by acreage, but should be based on actual available resources. DPEIS at 8.3-30. This description also fails to correspond with descriptions later in the document that admit the Gillespie SEZ would affect four grazing allotments. DPEIS at 8.3-29.

It is similarly unclear why the BLM believes that it would be appropriate to mitigate impacts to grazing allotments with additional range developments. Range developments have profound impacts of vegetation, soils, and invasive species. We suggested, and BLM has ignored, that the agency facilitate the retiring of grazing allotments as a mitigation measure instead of increasing livestock impacts on the remaining, undeveloped lands.

The amount of water being discussed in the DPEIS is enormous. Table 8.3.1.3-1. The availability of this water has not been demonstrated. DPEIS at 8.3-56. Water availability in Arizona is extremely uncertain, and the idea that Arizona will give up a share of its precious water to produce electricity for export to California and the west-wide grid is highly speculative. The DPEIS fails to account for these transfers or substantiate its claims about available water resources in the Phoenix AMA.

Impacts to the riparian areas dependent on the same aquifer should be considered more thoroughly than the DPEIS currently considered them. The admissions in the cultural resources section of Table 8.3.1.3-1 are striking: "Development in the proposed SEZ would eliminate some traditionally important plants and some habitat of traditionally important animal species." This conflicts with statements elsewhere in the DPEIS that downplay the significance of the effects on habitat.

It is clear from the map in Figure 8.3.3.1-1 that the areas being considered by the BLM for solar development would completely fragment and isolate the specially-reserved areas on BLM lands. The continuity and connectivity benefits of adjacent Wilderness, monuments, and

special resource management areas would be utterly undone by opening all the other BLM lands in the region. With industrialized solar development in the interstices, the value of the habits at each otherwise protected area is diminished. The preferred alternative would have isolating consequences for wildlife populations.

The statements in the DPEIS regarding the decommissioning and reclamation of the solar site are entirely unrealistic. The DPEIS states that the site would be reclaimed it its preconstruction state. 8.3-61. One only need to watch this video (http://www.youtube.com/watch?feature=player_embedded&v=5BGRD21H07Y) to understand how impossible it will be to ever restore the Sonoran desert to pre-industrialized state. (The video is taken in California at the BrightSource Energy development on BLM land.) The unlikelihood that this site can ever be "reclaimed" (and we note that BLM is using the language of the 1872 Mining Act rather than the contemporary "restoration") is demonstrated by the inclusion of precipitation data later in the DPEIS. DPEIS at 8.3-65. The area averages 7.6 inches of rain annually. Id. Perennial vegetation in this desert is slow-growing and would take centuries to re-colonize the development site. This realistic time-frame should be made more explicit in the DPEIS. Statements such as "Re-establishment of desert scrub communities in temporarily disturbed areas would likely be very difficult and might require extended periods of time," (DPEIS at 8.3-73) are misleading because the use of the descriptor "temporary" is inaccurate and the "extended periods of time" is vague. This is a permanent and wholesale destruction of native vegetation that will take centuries, if ever, to restore.

7. NEVADA PROPOSED SOLAR ENERGY ZONES

Seven SEZ have been proposed in Nevada: Amargosa Valley (32,699 acres), Dry Lake (16,516 acres), Delamar Valley (17,932 acres), Dry Lake Valley North (49,775 acres), East Mormon Mountain (7,418 acres), Gold Point (5,830 acres), and Miller's (19,205 acres).

Four of these SEZ (Amargosa Valley, Dry Lake, Delamar Valley and, East Mormon Mountain) are in desert tortoise habitat.

Six of the seven SEZ are located within BLM grazing allotments: Millers (Monte Cristo Allotment), Gold Point (Magruder Mountain Allotment), Dry Lake (Dry Lake Allotment) Mormon Mountain (Gourd Springs and Summit Springs allotments), Dry Lake Valley (Wilson Springs, Simpson and Ely allotments), and Delamar (Buckhorn and Oak Springs allotments.

Three of the SEZ (Amargosa Valley, Dry Lake Valley North, and Delamar Valley) are situated in regions of the state with very limited ground and surface waters. These water-related issues make these areas unsuitable for further consideration.

Comments Specific to the Proposed Amargosa Valley SEZ (Nevada)

The proposed 31,625 acre Amargosa Valley SEZ is located in Nye County in southern Nevada near the California border. The proposed Amargosa Valley site lies between Death

Valley National Park and Ash Meadows National Wildlife Refuge and is part of the Death Valley regional groundwater flow system.

The 23,000 acre Ash Meadows National Wildlife Refuge provides habitat for 12 species listed under the Endangered Species Act. The refuge was established specifically to protect these threatened and endangered species. Most of the listed species are dependent on aquatic or wetland environments within the refuge. The refuge also includes the National Park Service administered Devil's Hole, the only known habitat for the Devil's Hole pupfish. On November 4, 2008, the Nevada State Engineer issued Order 1197 announcing that new applications to appropriate additional water from the Amargosa Desert basin within 25 miles of Devil's Hole would be denied due to concern over the effect of groundwater pumping on the water level in Devil's Hole. Based on the above, the Amargosa Valley study area should be eliminated from further consideration as a Solar Energy Zone.

The desert tortoise section does not discuss important information relevant to the analysis of impacts. The desert tortoise population in the local area (Amargosa Desert/Pahrump Valley) can be genetically delineated from other desert tortoise populations in Nevada, yet none of the established Nevada desert tortoise ACECs adequately conserves this population (Britten *et al*., 1997[7]). The genetic lineation of the "Amargosa" desert tortoise sub-type has been confirmed and refined by Haggerty, 2008[8].

The Amargosa desert tortoise subtype is also of scientific interest since it occupies the northern end of the species range. The limited occurrence, importance to genetic diversity and under representation of the sub-type in conservation areas underlies the need to conserve this desert tortoise population. This is especially important given the threats posed by global climate change. As the USFWS 2008 Draft Revised Recovery Plan noted, "Climatic regimes are believed to influence the distribution of plants and animals through species-specific physiological thresholds of temperature and precipitation tolerance. Warming temperatures and altered precipitation patterns may result in distributions shifting northward and/or to higher elevations, depending on resource availability (Walther et al. 2002). We may expect this response in the desert tortoise to reduce the viability of lands currently identified as "refuges" or critical habitat for the species." (USFWS 2008 at 133) The proposed Amargosa SEZ will block any northward shift of this population because it crosses the Amargosa Valley.

The cumulative effects analysis points out that there are 14,070 acres in the proposed SEZ that already have approved projects or projects under NEPA analysis. The SEZ estimates that another 25,300 acres would be developed over a 20 year analysis horizon. However, the DPEIS does not include any analysis of the potential impacts and effects of over 39,000 acres of desert tortoise habitat being destroyed.

[7] Britten, H. B., Riddle, B. R., Brussard, P. F., Marlow, R. and Lee, Jr., T. E. 1997. Genetic delineation of management units for the desert tortoise, *Gopherus agassizii*, in the northeastern Mojave Desert. Copeia 1997: 523-530.

[8] Hagerty, B. 2008. Ecological Genetics of the Mojave Desert Tortoise. PhD. Dissertation. University of Nevada, Reno. 244 pp.

Because of resource conflicts related to water resources, desert tortoise, other threatened and endangered species, and other special status species, BLM should remove the Amargosa SEZ from further consideration.

Comments Specific to the Proposed Dry Lake Valley North SEZ & Delamar Valley SEZ (Nevada)

The Dry Lake and Delamar Valleys are part of the White River Flow System. Groundwater in these two basins has been fully appropriated over-appropriated in down gradient basins. These proposed Dry Lake Valley North SEZ and Delamar Valley SEZ are inappropriate locations for solar energy project development due to the lack of groundwater. BLM should remove the proposed Dry Lake Valley North SEZ and the Delamar Valley SEZ from further consideration.

Comments Specific to the Proposed East Mormon Mountain SEZ & Dry Lake SEZ (Nevada)

The proposed Dry Lake SEZ is located on the Dry Lake playa. Playas are significant ecotypes that are underrepresented in conservation areas. Barren, usually alkaline desert playas (dry lakebeds), are found in closed basins in the Intermountain West. These basins are intermittently (once every few years) or seasonally (every year) flooded. Water is prevented from percolating through the soil by an impermeable subsurface layer and is left to evaporate. Salt crusts and high salt in the soils greatly affect species composition. While the appearance is barren, some species such as iodinebush, black greasewood, spiny hopsage, Lemmon's alkali grass, Great Basin wildrye, saltgrass, or saltbush occur around the margins of the playa. This system grades into salt-desert scrub and sagebrush habitats. Downwind of playas, active and stabilized sand dunes often form. Thus if the subsurface of a playa is disturbed, the playa's integral role in the ecosystem may irreversibly untangle.

Both the proposed East Mormon Mountain SEZ and the proposed Dry Lake SEZ include desert tortoise habitat. East Mormon Mountain is immediately adjacent to the Mormon Mesa DWMA and Beaver Dam Slope DWMA in the Northeastern Mojave Recovery Unit. Recent monitoring reports from USFWS indicate that the northern populations within the Northeastern Mojave desert tortoise Recovery Unit are low and appear to be declining. Because environmental stressors are indicated as a reason for this species decline, these SEZ should be withdrawn from further consideration as Solar Energy Zones.

Comments Specific to the Proposed Gold Point SEZ (Nevada)

The proposed Gold Point SEZ, totaling an area of 4,810 acres, is located in upper Lida Valley, a closed basin lying between MacGruder Mountain and Slate Ridge. The locale is currently pristine and remote from load centers, and a new transmission line would be needed to provide access from the SEZ to the transmission grid. There resident pronghorn herd that stays in the Valley year-round. No other active energy development projects have been proposed near this site. Because of its remoteness, pristine condition, lack of water, and other conflicts, BLM should withdraw the proposed Gold Point SEZ from further consideration.

8. UTAH PROPOSED SOLAR ENERGY ZONES

Three proposed SEZ have been identified in Utah: Escalante Valley (6,614 acres), Milford Flats South (6,480 acres), and Wah Wah Valley (6,097 acres).

The ground water situation in the region is critical with most of the basins currently over-appropriated and closed to new surface water and groundwater appropriations (Utah DWR 2010).

The three study areas lie within BLM grazing allotments. Escalante Valley is within Butte Allotment, Milford Flats South is within the Minersville allotment group, Wah Wah Valley is in Wah-Wah Watson Allotment.

Bald eagle, *Haliaeetus leucocephal*, may occur on all the Utah SEZ. Bald eagles are protected under the under The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). Although the DPEIS mentions the loss of foraging habitat it fails to analyze risks from structures associated with solar power plants. This deficit must be addressed. The DPEIS recognizes that the fully protected golden eagle (*Aquila chrysaetos*) may forage on the proposed Utah SEZ. The USFWS currently does not issue "take" permits for this species because the species is declining. Loss of foraging habitat that results in a decrease in productivity or nest abandonment is considered "take". Although the DPEIS mentions the loss of foraging habitat it fails to analyze risks from structures associated with solar power plants. Required upgrades to existing transmission lines may exacerbate the risks of take.

Comments Specific to Escalante Valley SEZ (Utah)

The proposed 6,614 acres Escalante Valley SEZ is located in Iron County in southwestern Utah.

This relatively remote site would need construction of extensive new access roads. New transmission lines or upgrades of existing transmission lines would be required to bring electricity from the proposed Escalante Valley SEZ to load centers. The size and location of these are not described further in the DPEIR. However, since these will have similar impacts to the SEZ itself, they must be described in the cumulative effects analysis.

The proposed Escalante Valley SEZ is within Butte grazing allotment and would remove about 20% of the allotment. The SEZ-Specific Design Features states "Consideration should be given to the feasibility of replacing all or part of the lost AUMs through changes in grazing management or in development of additional range improvements on public lands remaining in the allotment." DPEIS at 13.1-5. We suggested in our scoping comments that the BLM should also allow for relinquishment of those AUMs. It is unclear why the BLM believes that it would be appropriate to mitigate impacts to grazing allotments with additional range developments. Range developments have profound impacts of vegetation, soils, and invasive species. We suggested, and BLM has ignored, that the agency facilitate the retiring of grazing allotments as a mitigation measure instead of increasing livestock impacts on the remaining, undeveloped lands.

If development of additional range improvements involves developing waters or constructing fences, the BLM must include the impacts of these foreseeable projects in the cumulative effects analysis.

The proposed Escalante Valley SEZ provides habitat for a number of candidate species and other special status species including the greater sage-grouse, western burrowing owl, the ferruginous hawk, the pygmy rabbit, the bald eagle, and the Utah prairie dog. The Escalante Valley SEZ and its affected area are completely within crucial pronghorn habitat. The cumulative effects must include an analysis of the expected new road construction, and new transmission lines and upgrades on each of these species.

Although it has not been surveyed, the BLM believes that the proposed Escalante Valley SEZ has a high potential for containing prehistoric sites in the dune area on the west side of the SEZ; it also has some potential for containing historic sites. The BLM states that "A cultural resource survey of the entire area of potential effects, including consultation with affected Native American Tribes, would first need to be conducted to identify archaeological sites, historic structures and features, and traditional cultural properties, and an evaluation would need to follow to determine whether any are eligible for listing in the NRHP as historic properties." But this is yet another example of putting the cart before the horse. BLM needs to do these surveys and consultations prior to defining the SEZ, so that the agency can ensure that the SEZ is an area with low resource conflicts.

Comments Specific to Milford Flats South SEZ (Utah)

The proposed 6,480 acres Milford Flats South SEZ is located in Beaver County in southwestern Utah about 21 mi (34 km) northeast of the proposed Escalante Valley SEZ.

This SEZ would need construction of extensive new access roads (about 5 miles). About 19 miles of new transmission lines or upgrades of existing transmission lines would be required to bring electricity from the proposed Milford Flats South SEZ to load centers. The size and location of these are not described further in the DPEIR. However, since these will have similar impacts to the SEZ itself, these reasonably foreseeable projects must be considered in the cumulative effects analysis.

The proposed Milford Flats South SEZ is within the Minersville allotment group and would remove about 10-15% of the allotments. DPEIS 13.2-5. The SEZ-Specific Design Features states "Consideration should be given to the feasibility of replacing all or part of the lost AUMs through changes in grazing management or in development of additional range improvements on public lands remaining in the allotment." DPEIS at 13.2-5. We suggested in our scoping comments that the BLM should also allow for relinquishment of those AUMs. It is unclear why the BLM believes that it would be appropriate to mitigate impacts to grazing allotments with additional range developments. Range developments have profound impacts of vegetation, soils, and invasive species. We suggested, and BLM has ignored, that the agency facilitate the retiring of grazing allotments as a mitigation measure instead of increasing livestock impacts on the remaining, undeveloped lands. If development of additional range

improvements involves developing waters or constructing fences, the BLM must include the impacts of these foreseeable projects in the cumulative effects analysis.

The proposed Milford Flats SEZ provides habitat for a number of list, candidate, and other special status species including the greater sage-grouse, western burrowing owl, the ferruginous hawk, the pygmy rabbit, the bald eagle, and the Utah prairie dog. The Milford Flats SEZ and its affected area are completely within crucial pronghorn habitat. The cumulative effects must include an analysis of the expected new road construction, and new transmission lines and upgrades on each of these species.

The BLM states that "A cultural resource survey of the entire area of potential effects, including consultation with affected Native American Tribes, would first need to be conducted to identify archaeological sites, historic structures and features, and traditional cultural properties, and an evaluation would need to follow to determine whether any are eligible for listing in the NRHP as historic properties." But this is yet another example of putting the cart before the horse. BLM needs to do these surveys and consultations prior to defining the SEZ, so that the agency can ensure that the SEZ is an area with low cultural resource conflicts.

Comments Specific to Wah Wah Valley SEZ (Utah)

The proposed 6,097 acres Wah Wah Valley SEZ is located in Beaver County in southwestern Utah about 21 miles northwest of the proposed Milford Flats South SEZ.

The proposed Wah Wah Valley SEZ will have serious impacts on special status species particularly the greater sage-grouse. Transmission access to the proposed Wah Wah Valley SEZ currently does not exist. The nearest existing transmission line is a north–south running 130-kV about 42 miles east of the SEZ. As of February 2010, there were no ROW applications for solar projects within the SEZ. Because of the resource conflicts, the lack of transmission and the lack of demand, BLM should drop this SEZ from further consideration.

The proposed Wah Wah Valley SEZ will occupy about 2.6% of the Wah-Wah Lawson allotment. DPEIS 13.3-23. The SEZ-Specific Design Features states "Consideration should be given to the feasibility of replacing all or part of the lost AUMs through changes in grazing management or in development of additional range improvements on public lands remaining in the allotment." DPEIS at 13.1-5. We suggested in our scoping comments that the BLM should also allow for relinquishment of those AUMs. It is unclear why the BLM believes that it would be appropriate to mitigate impacts to grazing allotments with additional range developments. Range developments have profound impacts of vegetation, soils, and invasive species. We suggested, and BLM has ignored, that the agency facilitate the retiring of grazing allotments as a mitigation measure instead of increasing livestock impacts on the remaining, undeveloped lands. If development of additional range improvements involves developing waters or constructing fences, the BLM must include the impacts of these foreseeable projects in the cumulative effects analysis. In this case, the effect on the permittee would be so small that BLM should simply decrease the authorized AUM pro rata.

The proposed Wah Wah Valley SEZ provides habitat for a number of candidate species and other special status species including the greater sage-grouse, western burrowing owl, the ferruginous hawk, the pygmy rabbit, the bald eagle, the golden eagle, and the Utah prairie dog. The Wah Wah Valley SEZ and its affected area are completely within crucial pronghorn habitat. The cumulative effects must include an analysis of the expected new road construction, and new transmission lines and upgrades on each of these species. The proposed transmission line that would be required to develop this SEZ passes through crucial greater sage-grouse brooding habitat. That conflict alone is sufficient to enough to invalidate any further selection of this proposed SEZ

Only one small, 2-acre survey for a gravel pit has been conducted within the proposed Wah Wah Valley SEZ; consequently, no archaeological sites have been recorded by the BLM. DPEIS at 13.3-231. Although it has not been surveyed, the BLM believes that the proposed Wah Wah Valley SEZ has the potential to contain significant cultural resources, although the potential is relatively low. The BLM states that "A cultural resource survey of the entire area of potential effects, including consultation with affected Native American Tribes, would first need to be conducted to identify archaeological sites, historic structures and features, and traditional cultural properties, and an evaluation would need to follow to determine whether any are eligible for listing in the NRHP as historic properties." But this is yet another example of putting the cart before the horse. BLM needs to do these surveys and consultations prior to defining the SEZ, so that the agency can ensure that the SEZ is an area with low resource conflicts.

9. THE DPEIS IS FATALLY FLAWED AND WILL REQUIRE RECIRCULATION OF A REVISED DPEIS

The DPEIS is fatally flawed in a number of respects that will require the BLM to prepare a supplemental NEPA document for recirculation for public comment. The DPEIS provides no quantitative estimates of the numbers of affected individuals for the many threatened and endangered, and special status species that will be affected by the three alternatives. It fails to even list the threatened and endangered species that occur in the areas opened to development under the preferred alternative.

The BLM states in the DPEIS that for its preferred alternative it was unable to obtain complete geographic information system (GIS) data across the six-state study area and thus could not map the exact footprint of the alternative nor calculate the exact acreage. DPEIS at 2-3.

These deficiencies amount to failure to comply with provisions of the Endangered Species Act, FLPMA as well as NEPA. The BLM should prepare a revised Draft PEIS that reviews an adequate range of alternatives, that adequately describes the direct, indirect, and cumulative impacts, and that takes a hard look at those environmental impacts.

We thank you for the opportunity to provide these comments on the Draft PEIS, and we look forward to seeing our recommendations incorporated in the next iteration of this document.

Please continue to include Western Watersheds Project on your list of interested public for all future mailings.

Sincerely,

Michael J. Connor, Ph.D.,
California Director
Western Watersheds Project
P.O. Box 2364
Reseda, CA 91337-2364.
(818) 345-0425
<mjconnor@westernwatersheds.org>

Thank you for your comment, Jason Lloyd.

The comment tracking number that has been assigned to your comment is SolarD11807.

Comment Date: May 2, 2011 12:05:49PM
Solar Energy Development PEIS
Comment ID: SolarD11807

First Name: Jason
Middle Initial: M
Last Name: Lloyd
Organization: L Bar C Ranch
Address: P.O. Box 281
Address 2:
Address 3:
City: Pioche
State: NV
Zip: 89043
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Jason's solar comment letter II.rtf

Comment Submitted:

May 2, 2011

Solar Energy PEIS
Argonne National Laboratory
9700 South Cass Avenue – EVS/900
Argonne, Illinois 60439

RE: Comments to the Solar Programmatic Environmental Impact Study

To Whom It May Concern:

I am very concerned with the current proposed solar site in Dry Lake Valley North. I am the grandson of Kenneth Lytle, and I run cattle with him on his allotment in this valley. The Simpson allotment and all of the proposed area to the north of it is our entire winter range. If this grazing area is turned into a place for solar development, we lose our entire herd and would be pushed out of business. I am a sixth-generation rancher of Lytle Ranches, and my son would become a seventh-generation rancher. We have been using this valley for over 100 years.

We also own several water rights in this valley and have made many range improvements over the past 100 years. I believe that a developer would have to compensate us heavily if he or she were to choose this area for a solar site because of the recent decision made in the Wayne Hage case. Most importantly, however, would be the valuable loss of vegetation in the area since it represents one of the best white sage locations in the state of Nevada. White sage is a very delicate plant that is easily destroyed and that can not be reintroduced. Once this valuable range is destroyed, it is ruined forever.

The ranchers in this area also contribute significantly to the economic survival of Lincoln County. For over 150 years the ranchers in this area of Dry Lake Valley North have played a big role in contributing to the welfare of this county.

At a meeting in 2009, at the Caliente BLM, ranchers and government representatives met and outlined alternate areas for solar that would have few, if any, impacts on all aspects involved. These alternate site were supposed to replace the original conflicting sites, yet it seems that our hard work and comments were ignored. The alternate sites were must added to the original to make the studied area in Dry Lake Valley North a ridiculous number of proposed acreage. I urge you to reconsider the areas you have outlined for solar if they affect grazing rights whatsoever. This state needs to keep these grazing grounds intact for the future needs of our country. Everyday, ranchers across the United States are selling out to developers for the huge price tag attached to their lands. The number of ranchers, especially the small rancher, is declining rapidly. Please don't add to this demise.

Sincerely,

Jason Lloyd

Thank you for your comment, John Moody.

The comment tracking number that has been assigned to your comment is SolarD11808.

Comment Date: May 2, 2011 12:41:23PM
Solar Energy Development PEIS
Comment ID: SolarD11808

First Name: John
Middle Initial: R
Last Name: Moody
Organization: Desert Survivors
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment: Solar PEIS.docx

Comment Submitted:

May 1, 2011

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Ave – EVS/240
Argonne, Illinois 60439

I would like to provide the following Comments upon the Draft Solar PEIS, dated December 2010 on behalf of the citizen activist group Desert Survivors.

1) Due to the large size and complexity of the Draft PEIS the review and comment period is inadequate and should be extended. The California Affected Environment section (8-13) is almost 1500 pages long. Even a cursory review of it indicated issues. Even as a organization focused upon primarily California Desert issues, with over thirty years visiting the areas we need more time to adequately review and comment. A Draft PEIS of this magnitude needs significantly more time for public comment.
2) Significant issues raised during the Scoping Process do not appear to have been adequately addressed, merely sidestepped.
3) The Draft PEIS fails to contextualize the drive to industrial scale energy development on Federal lands. Because of the unbelievable scale of the project and its potentially devastating impact on the affected ecological communities and landscapes more effort should have been taken to address the need for such a rushed program. How or if this program fits into a National energy policy is critical to understanding the ecological sacrifices it accepts.
4) Alternatives such as distributed generation are seemingly dismissed as inadequate; inadequate to what?
5) The Draft PEIS appears to facilitate a rushed grab of generally intact Federal lands for short term industrial scale energy production. While the life cycle of many of the proposed projects are only about thirty years, the ecological devastation to the desert lands will be permanent. If this scale of destruction is truly necessary or desirable it needs to be more adequately justified and opened to comment.
6) Given that the technology and economics of alternative energy production are rapidly changing the Draft PEIS should identify more alternatives than those presented. Additionally, more actual comparison and contrast between alternatives is needed.
7) Again, because of the huge scale of the Program, truly a national endeavor redirecting National energy policy, more effort to address alternatives such as use of private and previously impacted lands should be addressed.
8) The alternative of Federal buy back of degraded private lands or subsidization of Utility acquisition of those lands should be developed.
9) The Draft PEIS needs to better address the post project ecological condition of the project lands. The desert eco-systems will not be restorable on bladed lands. So what are the

long term consequences of such destruction? What are the mitigations that will most closely replicate the sustainable ecological systems that exist there now? What are the steps necessary to achieve those ends?

10) The Draft PEIS needs to better address the potential biological needs of plant and wildlife communities facing the rapid onset of climate change. An analysis of past climatic change events and the projection of potential alternative scenarios to the Program area, as a basis for environmental impact analysis between alternatives are appropriate for such a large project.
11) The cumulative impact of these projects necessitates a broad scale regional and landscape scale review and analysis that this Draft PEIS fails to do. Individual project level EIS or EA will not address the cumulative environmental impacts. This Draft PEIS should do that, but is inadequate.
12) There is not currently adequate baseline knowledge of the biological conditions or integrity of the proposed Program Area to develop a Final PEIS. The idea that it can be addressed with an expanded species analysis between the Draft PEIS and the Final PEIS is absurd to the point of criminality. The deserts of the American southwest have been historically understudied. We really do not even know how many different species we could expect to find. UC Riverside has indicated that at current rates of study we can expect to still be finding new species for another couple of hundred years. This Draft PEIS streamlines a process to utterly devastate huge swaths of prime habitat in the next 5 to 10 years. The Draft PEIS needs to address our lack of knowledge of what exists now, and identify strategies to address regional and landscape level study and analysis as a prerequisite to disturbance. This Draft PEIS will undoubtedly contribute to the eradication of species that we do not even know exist today.
13) The technical alternatives to Industrial Scale Solar Projects in the Desert are not adequate and do not address the evolving nature of such technologies.
14) The economics of distributed generation should be better developed and analyzed. The Distributed versus Industrial Scale Solar on Intact Federal Land comparison is false. A blend of distributed and industrial scale is more realistic and allows for more rational prioritization of land use and protection. It is not black or white, either/or and this Draft PEIS appears to over-simplify the issues.
15) Cumulative effects analysis should be addressed in the Draft PEIS. A project-specific environmental review will not address the regional and landscape level impacts that this scale of land use change will cause.
16) The proposed BLM SEZs were inadequately developed and the process not sufficiently open to public participation. The proposed SEZs should be set aside until an open and rigorous process of analysis and identification is done. The process was rushed and under resourced. Multiple BLM staffers have privately indicated that the process was a paper drill and could have been done better if it had not been rushed. Additionally, several public stakeholder groups have undertaken to identify less harmful alternatives to

the proposed SEZs and have been shunned or denied participation in the interagency discussions. Desert Survivors along with several other stakeholder groups identified over 100,000 acres in the California desert regions that would be better suited to industrial scale use but were not allowed to participate.

17) Distributed small parcel (under 247 acres) use needs to be incorporated into the Draft PEIS as an alternative to Industrial Scale projects.
18) The BLM land use plans for all the proposed project areas need to be developed and finalized before a PEIS is for the project is finalized.
19) This Draft PEIS is inadequate to support the development of a Final PEIS. A second Draft PEIS that is broader in scope and finer in detail needs to be developed and vetted before a Final PEIS is considered.
20) The overall appearance of this Draft PEIS is that it was well funded to create an inadequate but speedy endorsement for a new industrial gold rush into the desert lands of the American Southwest.

Please accept these comments from Desert Survivors, with over 700 active members dedicated to the protection of the American Deserts as you consider your next steps in this process

Sincerely,

John R. Moody
Director at Large (Issues)
Desert Survivors

Thank you for your comment, Jenny Neeley.

The comment tracking number that has been assigned to your comment is SolarD11809.

Comment Date: May 2, 2011 13:52:19PM
Solar Energy Development PEIS
Comment ID: SolarD11809

First Name: Jenny
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Organization: Sky Island Alliance
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Address 3:
City: Tucson
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Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: BLM solar PEIS_SIA comments.pdf

Comment Submitted:

SKY ISLAND ALLIANCE
Protecting our Mountain Islands and Desert Seas

May 2, 2011

Linda Resseguie, BLM Solar PEIS Project Lead
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Re: Comments on Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear Ms. Resseguie:

These comments are being submitted in response to the Bureau of Land Management (BLM) and Department of Energy (DOE) Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Solar Development PEIS). Sky Island Alliance (SIA) is a non-profit conservation organization dedicated to the protection and restoration of the rich natural heritage of native species and habitats in the Sky Island region of the southwestern United States and northwestern Mexico. We work with many partners to establish protected areas, restore healthy landscapes, and promote public appreciation of the region's unique biological diversity. We appreciate the opportunity to comment on the PEIS. We submit these comments as a supplement to the comments we submitted jointly with The Wilderness Society and other organizations in a letter dated May 2, 2011.

SIA is generally supportive of the Solar Energy Zones (SEZ) Alternative, but strongly opposes the Solar Development Program (SDP) Alternative. In light of the significant failings of the SDP Alternative, we are very concerned that the BLM has designated it as their preferred alternative. We strongly urge the BLM to instead choose the SEZ Alternative and incorporate the suggested modifications found below and in our previously submitted comments.

The BLM should select the Solar Energy Zones (SEZ) Alternative as its preferred alternative.

For the proposed solar energy program to be successful in the long-term, it must provide clear policy and concrete guidelines that will effectively and efficiently guide projects to the most appropriate locations. This will reduce obstacles and provide certainty for construction of the most appropriate projects, while limiting environmental impacts to the greatest extent possible.

The SEZ Alternative outlined in the Solar Development PEIS provides an excellent framework for such a program. First, and most importantly, this program adopts a land-use planning approach and identifies the most appropriate and least environmentally sensitive locations for solar energy development, and guides solar projects to those areas. To identify the most appropriate BLM

lands for solar development, the agency correctly focused on those lands that provide excellent solar resources, flat land, and proximity to existing roads and electrical transmission lines. The agency also attempted to limit environmental conflicts by filtering out those areas encompassing important wildlife habitat, wildlands, recreation areas and other important resources.

We strongly support this approach for identifying lands appropriate for solar development. However, we believe the process for identifying areas to include in SEZs needs to be refined in order to take into consideration and provide protection for other critical natural resource values. For example, the categories of lands deemed inappropriate for solar development must include not only officially protected BLM lands, such as designated Wilderness areas, National Monuments, and other lands included in BLM's National Lands Conservation System (NLCS), but should also include those areas that are considered suitable for wilderness designation or that are shown to have wilderness characteristics. This includes Citizens' Wilderness Proposals.

BLM lands that are adjacent to designated Wilderness areas, NLCS lands, or other protected areas should also be removed from consideration in order to provide a buffer and fully protect those resources. This should include areas adjacent not only to protected BLM lands, but to all federally protected lands, regardless of the managing agency, as well as state trust lands, private lands and lands designated for protection by local jurisdictions through land use planning processes. This includes the Conservation Lands System developed by Pima County, Arizona, as part of the Sonoran Desert Conservation Plan, and the Arizona Wildlife Linkages Assessment planning effort developed by many federal, state and non-profit partners, including the BLM and Sky Island Alliance.

The SEZs currently under consideration in the DPEIS include more than three times as much land as the BLM forecasts will be developed during the 20-year life of the PEIS. Though the acreage of the SEZs may change through refinements in the PEIS process, such as those recommendations offered above, it is clear that the SEZ Alternative offers plenty of flexibility to build a foundation for solar development on public lands. In conjunction with the recommendations submitted jointly with The Wilderness Society and others, including a recommendation that the BLM create a process for designating new SEZs, we believe the SEZ alternative provides an excellent framework for an effective solar energy development program that reduces to the greatest extent possible environmental impacts that may result from solar development.

The BLM should reject the Solar Development Program (SDP) Alternative.

We strongly oppose the SDP Alternative, and urge the BLM to reject this alternative and instead select the SEZ Alternative as its Preferred Alternative. The BLM should not carry forward a plan that opens approximately 22 million acres to development, over 100 times more land than what the agency's own analysis says will likely be needed in the next twenty years. By identifying such a grossly excessive amount of acreage for potential solar development, this alternative offers virtually no guidance or certainty for those looking to develop low-conflict solar energy projects, and it includes far too many places that should instead be protected from such development.

The SDP Alternative includes 4.45 million acres of BLM lands in Arizona, representing more than a third of all surface lands managed by the agency across the state, despite the fact that the BLM's own Reasonably Foreseeable Development Scenario anticipates only approximately 21,816 acres of solar energy development on its lands over the next twenty years. Aside from being extremely overbroad, a significant portion of the area within Arizona identified as open for solar development in the SDP Alternative is completely inappropriate for solar development and must be excluded from consideration, including areas within the Sky Island region that provide important wildlife habitat and landscape connectivity, the health and integrity of which are critical for the wellbeing of the entire region. These areas include those lands encompassed by Pima County's Sonoran Desert Conservation Plan Conservation Lands System, and lands within the San Pedro river valley.

Sonoran Desert Conservation Plan Conservation Lands System

Sky Island Alliance is a proud member of the Coalition for Sonoran Desert Protection, and we fully support the comments submitted by the Coalition in their letter dated May 2, 2011. Should the BLM choose to move forward with the SDP Alternative as its Preferred Alternative, it should remove all lands that overlap with the Sonoran Desert Conservation Plan Conservation Lands System and associated Management Areas. This includes the following acreage:

- 57,211 acres that overlap with Important Riparian Areas;
- 85,167 acres that overlap with Biological Core Management Areas; and
- 1,418,536 acres that overlap with Multiple Use Management Areas.

Please refer to the Coalition for Sonoran Desert Protection's May 2, 2011 comment letter for more information on the Sonoran Desert Conservation Plan, the associated Management Areas, and why it is critical that the BLM lands that overlap with these areas be protected in their entirety. As stated above, it is important that adjacent lands are also eliminated from consideration in order to buffer these important lands from harmful land use activities.

Lands within San Pedro River Valley

The SDP Alternative would allow roughly 15,000 acres of land in the San Pedro River watershed to be available for solar development. We strongly recommend that these acres be removed from further consideration for solar development, should the BLM choose to move forward with the SDP Alternative as its Preferred Alternative.

The San Pedro River is last free-flowing river in the southwest United States, and is home to an incredible abundance of biodiversity: over 400 bird species, 100 butterfly species, 83 mammals, and 47 amphibian and reptile species have been documented along the River and adjacent lands. Congress recognized the significance of this place and in 1988 created the San Pedro National Riparian Conservation Area (SPNRCA) in order to protect this rare desert riparian area. The San Pedro River is also internationally significant as an important flyway that provides habitat for hundreds of migratory and native birds, and as such was designated by state and national Audubon Important Birding Area (IBA) science committees as a Global IBA in 2008.

It is critical that this area remain free from land use activities that have the potential to compromise the river, its water resources, and surrounding valley and watershed. Riparian areas are the single most imperiled ecosystem type in the desert southwest, and the San Pedro River and surrounding valley already face enormous pressure from human development, off-road vehicle use and livestock grazing, among other things. The area inside the boundaries of the SPNRCA is omitted from the SDP Alternative, however it is critical that lands adjacent to the SPNRCA and the entire watershed that feeds the river also be spared from solar energy development.

We appreciate the opportunity to comment on the Solar Development PEIS. Please continue to include SIA as an interested party and direct all future public notices and documents to me at the address below.

Sincerely,

Jenny Neeley
Conservation Policy Director

Thank you for your comment, Rebecca Schwendler.

The comment tracking number that has been assigned to your comment is SolarD11810.

Comment Date: May 2, 2011 13:56:13PM
Solar Energy Development PEIS
Comment ID: SolarD11810

First Name: Rebecca
Middle Initial: H
Last Name: Schwendler
Organization: Cultural Resources Preservation Coalition
Address: c/o National Trust for Historic Preservation
Address 2: 535 16th St., Suite 750
Address 3:
City: Denver
State: CO
Zip: 80202
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: CRPC comments on Solar PEIS_5.2.11.pdf

Comment Submitted:

Please see the attached file.

Cultural Resources Preservation Coalition
c/o Rebecca Schwendler
National Trust for Historic Preservation
535 16th Street, Suite 750
Denver, CO 80026

May 2, 2011

Linda J. Resseguie
Solar Energy Draft PEIS
Argonne National Laboratory
9700 South Cass Avenue
EVS/240
Argonne, IL 60439

Submitted electronically at http://solareis.anl.gov/involve/comments/index.cfm

Re: Comments on the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (EIS No. 20100466)

Dear Ms. Resseguie:

The Cultural Resources Preservation Coalition (Coalition) commends the efforts of the Bureau of Land Management (BLM) to identify areas appropriate for solar energy development while limiting impacts to significant cultural resources. We feel strongly that, by guiding these energy projects to locations with the fewest possible resource conflicts, the BLM can facilitate efficient and cost-effective clean energy solutions while conserving the unique qualities of America's federal public lands. To this end, the BLM can use the Solar Programmatic Environmental Impact Statement (PEIS) to guide solar energy development without circumventing existing cultural resource laws and to increase the likelihood that impacts to significant cultural resources will be avoided, minimized or mitigated.

In general, the Coalition supports BLM's identification of specific solar energy zones (SEZs) that exclude an extensive list of cultural resource lands and resources. Accordingly, we support the SEZ Program Alternative, which would limit development to 677,000 acres, with some modifications. However, we remain concerned that the near-complete absence of prior cultural resource inventories and tribal consultation for specific SEZs will continue to be an impediment to effective planning for the management and protection of cultural resources. As such, the identified SEZs must remain flexible and subject to continued refinement as the BLM learns more about the potential for significant cultural resources to be affected by the plans.

In contrast, we find the Solar Energy Development Program Alternative (preferred alternative) to be unacceptable. As outlined in detail in the attached comments, we believe that the preferred alternative would leave too many significant cultural

resources vulnerable to direct and indirect impacts from solar energy development, and would undermine the entire SEZ concept and process.

Interests of the Cultural Resources Preservation Coalition

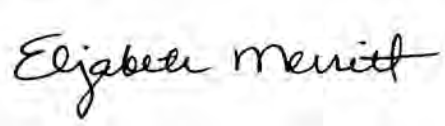
The Cultural Resources Preservation Coalition is a group of historic preservation, tribal, archaeology, anthropology, trails, recreation, business, and place-based organizations, led by the National Trust for Historic Preservation. The Coalition advocates for the protection of irreplaceable cultural resources located primarily on federal public lands managed by the BLM, the United States Forest Service, and the National Park Service.

Conclusion

When planning for large-scale solar energy development on federal public lands, the BLM must prioritize the protection of outstanding cultural resources, including—but not limited to—significant concentrations of prehistoric and historic archaeological sites, historic trails and Native American traditional cultural properties and sacred sites. We urge the BLM to select the SEZ Program Alternative as the preferred alternative in the PEIS, because it would likely result in far fewer impacts to significant cultural resources than the current preferred alternative.

We appreciate the opportunity to provide these comments and we look forward to participating further in the PEIS process.

Sincerely,



Elizabeth S. Merritt
Deputy General Counsel
National Trust for Historic Preservation

Carrie Gregory
Vice-President
Alliance for Historic Landscape Preservation

Damon Dozier
Director of Public Affairs
American Anthropological Association

Linea Sundstrom
Chair, Conservation Committee
American Rock Art Research Association

Michael J. Painter
Coordinator
Californians for Western Wilderness

Christina McVie
Board Secretary
Friends of Ironwood Forest

Thomas Hulen
Executive Director
Friends of the Sonoran Desert National Monument

Greg Seymour
Board Member
Nevada Archaeological Association

Douglas D. Dykeman
President
New Mexico Archaeological Council

Gary Werner
Executive Director
Partnership for the National Trails System

Leonard Becker
President & Co-Founder
Sacred Sites International Foundation

Enclosure: Recommendations for the Solar PEIS from the CRPC

Cc: Nancy Brown, BLM Liaison, Advisory Council on Historic Preservation
Lee Webb, Dep't of Energy Liaison, Advisory Council on Historic Preservation
Caroline Hall, Advisory Council on Historic Preservation
Reid Nelson, Advisory Council on Historic Preservation
Dr. Robin L. Burgess, Federal Preservation Officer, BLM
James Garrison, Arizona SHPO
Milford Wayne Donaldson FAIA, California SHPO
Edward Nichols, Colorado SHPO
Ronald M. James, Nevada SHPO
Jan Biella, Acting New Mexico SHPO
Wilson Martin, Utah SHPO

Recommendations to the Bureau of Land Management Regarding the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Cultural Resources Preservation Coalition
May 2, 2011

The Cultural Resources Preservation Coalition supports the identification of specific Bureau of Land Management (BLM) lands for solar energy development, a key goal outlined in the draft Programmatic Environmental Impact Statement (PEIS). However, we do not support the BLM's preferred alternative—the Solar Energy Development Program Alternative—as it would leave open more than 21 million acres of mostly unsurveyed public land in six western states to utility-scale solar development. Instead, we favor the Solar Energy Zone (SEZ) Program Alternative (SEZ alternative)—with some modifications—which would limit utility-scale solar energy development to 677,384 acres in 24 SEZs.

I. The preferred alternative is unacceptable because it will likely impact an exceedingly large number of significant cultural resources.

Despite the fact that the preferred alternative excludes the highest profile cultural resources, such as national historic trails (NHTs), national historic landmarks (NHLs), properties listed on the National Register of Historic Places (National Register), and traditional cultural properties (TCPs), from direct physical damage or destruction by solar energy development, these resources would remain vulnerable to visual and cumulative impacts. National Register-eligible cultural resources discovered during project planning would also be open to impacts. Furthermore, under the preferred alternative, 258 tracts of land are located within one mile of an NHT. Development on those lands would likely cause numerous adverse effects to the viewsheds and settings of those trails and their associated sites. By contrast, under the SEZ alternative, only two SEZs (De Tilla Gulch and Fourmile East, both in Colorado) lie within one mile of an NHT (Old Spanish NHT). Thus, the SEZ alternative is much more effective than the preferred alternative at reducing potential conflicts with significant cultural resources.

Exposing NHTs and thousands of other nationally significant cultural resources to adverse impacts from solar energy development is unacceptable, as well as inefficient and costly for developers. As currently drawn, the 24 SEZs contain more than three times as much land as the BLM forecasts will be developed during the 20 year life of the PEIS. Therefore, it is unnecessary for BLM to open so much additional public land for development.

Recommendations:

- In the event that BLM chooses the current preferred alternative, despite its overwhelming disadvantages and the lack of demonstrated need, we make several recommendations in sections II, III, IV, and VI below for reducing and mitigating its harm to significant cultural resources.
- Preferably, the BLM should de-select the Solar Energy Development Program Alternative as the preferred alternative and, instead, choose the SEZ Program Alternative as the preferred alternative, with the modifications recommended below in sections V and VI.

II. Specific areas, located outside the SEZs and identified as open to solar energy development under the preferred alternative, should be excluded from development consideration.

Recommendations:

- Arizona
    - *Ironwood Forest National Monument:* The BLM should exclude the following three parcels from around the Ironwood Forest National Monument:
        1. A small "b"-shaped parcel located adjacent to and immediately south and west of the Monument and northeast of the Tohono O'odham Reservation, less than 20 miles west of I-10 between Tucson and Casa Grande.
        2. A tiny parcel located northwest of the northwestern-most part of the Monument boundary in the Sawtooth Mountains.
        3. A parcel located north of the middle of the Monument, surrounded by state lands.

      Any solar energy development on these small, isolated parcels would undoubtedly have significant visual impacts on the Monument and/or the Reservation, and potentially on traditional cultural properties.

    - *Pinal County Open Space:* The BLM should exclude a larger "c"-shaped area of land located less than 10 miles east of I-10 between Tucson and Casa Grande. This area is currently cited as open space in the 2009 Pinal County Comprehensive Plan and contains numerous prehistoric archaeological sites.

    - *Red Rock Canyon:* The BLM should exclude solar energy development in the area of Red Rock Canyon, located north of I-8 southwest of Phoenix. The geologically unusual canyon contains prehistoric rock alignments, a concentration of petroglyphs that are hundreds to

thousands of years old, and several rock shelters containing cultural resources.

- *Santa Rosa Wash:* The BLM should exclude solar development south of I-8 around Santa Rosa Wash, located west of Tucson, because of the area's many large pre-classic period Hohokam villages.

- *Area Southwest of the West Silver Bell Mountains:* The BLM should exclude the southern portion of the area southwest of the West Silver Bell Mountains from solar energy development. Located near the Aguirre Wash, this area surrounds the old Spanish mission site of Santa Ana del Chiquiburitac. This was the last mission constructed in Primeria Alta in the late 1700's by Tohono O'odham laborers for Spanish Franciscan friars. Very few Spanish mission sites remain in Arizona so this one is undoubtedly nationally and regionally significant.

- *Poston Butte:* The BLM should exclude the area around Poston Butte, northwest of Florence, from solar energy development because of its extensive, intact cultural landscape associated with major habitation sites and a prehistoric canal system. While most of the archaeological sites are located on private land that adjoins BLM land, the BLM land includes associated archaeological features.

- Nevada

  - *Area West of Delamar Valley SEZ:* The BLM should exclude areas to the west and south of the Delamar Valley SEZ from solar energy development because of their significant concentrations of petroglyphs.

  - *"Double Negative" Art Installation:* Located in or near the East Mormon Mountain SEZ, the area surrounding this 1969 geological art installation should be excluded from solar energy development to protect it from physical and visual impacts.

- New Mexico

  - *Chupadera and Mesa Well Canyon:* The BLM should exclude the Chupadera and Mesa Well Canyon area north of SR380 from solar energy development, as it contains significant late prehistoric village sites, including several large pueblos numbering more than 100 rooms.

  - *Aqua Fria National Monument Area:* The BLM should exclude a larger area surrounding Agua Fria National Monument from solar energy development, given that several prehistoric habitation sites are known

on BLM lands east of I-17 and west of the monument, and additional significant sites are likely in the area.

III. <u>Certain areas and resources, located outside the SEZs, may be at risk from development under the preferred alternative and should be avoided.</u>

Recommendations:

- Arizona

    - ***Gila Bend Mountains**:* The BLM should avoid solar energy development in the Gila Bend Mountains, as they contain a rich array of prehistoric rock features and aboriginal trails. Notable concentrations of these features are found in scattered locations at the mountain edges fronting the Gila River, Red Rock Canyon and two unnamed canyons on the eastern slopes of the mountains. The cultural resources are believed to span thousands of years of human occupation in the area and represent the important prehistoric cultural traditions of the Hohokam and Patayan.

    - ***Sentinel Plain**:* The Gila Bend Mountains and the Gila River cut through the significant cultural landscape of the Sentinel Plain north of I-8 and west of Gila Bend. When evaluating locations for solar energy development, the BLM should avoid impacts to cultural resources in this landscape. For example, within the Gila Bend Mountains are canyons that include extensive rock features and trail systems, rock shelters, bedrock mortars, check dams, rock rings, masonry rooms, and petroglyphs. In fact, the Sentinel Plain area includes one of the most extensive galleries of prehistoric petroglyphs in western North American and several segments of prehistoric and historic trail segments, including the Juan Bautista de Anza and Mormon Battalion national historic trails and the Butterfield Overland Trail. Prehistoric rock features often referred to as geoglyphs are also found throughout the Sentinel Plain area near the Gila River. All of these fragile patterns on the landscape will be irrevocably lost if subject to the increased ground disturbances associated with solar energy development.

    - ***North End of the Picacho Mountains**:* The BLM should avoid solar development near the north end of the Picacho Mountains, as the whole area contains significant concentrations of petroglyphs. In addition, Picacho Mountain plays a role in the creation story of the Tohono O'odham Nation so it should be well separated from solar energy development.

- Colorado

    - *Paleoindian sites:* When evaluating the appropriateness of solar energy development in the San Luis Valley, in particular, the BLM should carefully consider potential impacts to rare Paleoindian sites and landscapes that generally are located in dunal areas.

- Nevada

    - *Prehistoric and Dry Lakes:* When evaluating the appropriateness of solar energy development in Nevada, the BLM should carefully consider potential impacts to likely significant archaeological and sacred sites and landscapes around prehistoric and dry lakes, such as ancient Lake Tonopah. These may need to be protected both physically and visually.

    - *Dunal Areas:* When evaluating the appropriateness of solar energy development in Nevada, the BLM also should carefully consider potential impacts to dunal areas, which often contain significant early cultural sites. Dunal landscapes should receive subsurface testing, not just surface survey, and should have their great research potential protected.

- Utah

    - *Southeast San Juan County:* The BLM should avoid solar energy development in the southeast corner of San Juan County, east of I-191 and along the corridor between Bluff, Blanding, and Monticello. Both areas contain nationally significant cultural resources spanning thousands of years, including very large pueblos, cliff dwellings, rock art, and historic homesteads.

IV. Several directives for identifying and protecting cultural resources are missing from the preferred alternative

Recommendations:

- **The BLM must consult with the NPS if National Historic Landmarks could be affected.**

  While NHLs are physically protected from solar energy development under both action alternatives, they may still be visually, indirectly and/or cumulatively affected by solar development. Section 110(f) of the National Historic Preservation Act (NHPA) requires federal agencies, to the maximum extent possible, to undertake such planning and actions as may be necessary

to minimize harm to NHLs. 16 U.S.C. § 470h-2(f). Given that the NPS administers the NHL program, the BLM must consult with NPS any time there is the potential for NHLs to be adversely affected. The Section 106 regulations specifically require the agency to notify the NPS and invite the NPS to participate in Section 106 consultation whenever "there may be an adverse effect" on an NHL resulting from the undertaking. 36 C.F.R. § 800.10(c). In this case, there is clearly the potential for adverse effects to NHLs. Accordingly, we urge the BLM to initiate consultation with the NPS at the earliest possible opportunity.

- **The BLM should map and assess transmission line routes in the PEIS because those lines will be necessary for solar development outside of the SEZs.**

  In addition to the solar installations themselves, the transmission lines needed to carry the energy produced—particularly under the preferred alternative—would have great individual and cumulative impacts to significant cultural resources and whole cultural landscapes. Related access roads and other infrastructure could also cause significant impacts. The attempt to assess environmental impacts on areas open for solar energy development—particularly outside the SEZs—without also assessing the impact of the transmission lines (and other infrastructure) necessary to transport that energy is misleading and incomplete. Individual lines and related webs of lines would potentially impact far more cultural resources than would individual solar developments themselves, and would be particularly detrimental to NHTs and TCPs, where viewsheds and settings are primary elements of their significance. Even if the individual transmission lines needed to carry the energy produced by utility-scale solar projects cannot be assessed specifically in the PEIS, the transmission infrastructure must be assessed concurrently with the projects that would require it. In other words, future project-specific EISs for solar development should include evaluations of the projects' specific transmission line needs and routes. If these reviews are not done concurrently, the analysis of cumulative effects of solar energy development will be grossly inadequate.

- **The BLM should outline measures for directing projects to SEZs.**

  It is unclear why the BLM invested significant time, money and effort to identify and then refine the SEZs if these will not be the primary target areas for solar energy development. The SEZs were selected for their combination of excellent solar resources, flat land, proximity to existing roads and transmission lines, and limited conflicts with important cultural and natural resources and values. These low-conflict areas are assumed to provide the

best locations for successful projects and will lead to solar development that is faster, cheaper and better for the environment, consumers and project developers. Accordingly, even if the preferred alternative were selected, the BLM should create strong incentives for developing solar energy projects within SEZs and strong disincentives for developing outside them. Information about these incentives and disincentives should be included in the final PEIS.

- **The BLM should identify characteristics of priority areas for development outside SEZs.**

  In addition to creating strong incentives for project development within SEZs, the BLM should guide the project development that does occur outside SEZs to the most appropriate lands. These could include previously disturbed places (e.g., brownfields and abandoned mine lands), areas located close to existing transmission lines, and previously inventoried lands containing few or no conflicts with significant resources. In the Final PEIS, the BLM should provide a list of characteristics of priority development areas.

V. The SEZ Program Alternative, with some modifications, should be the preferred alternative.

As stated above, we generally support the SEZ alternative and urge the BLM to accept it, with some modifications, in place of the current preferred alternative. We commend the BLM on excluding from the SEZs numerous categories of significant cultural resources, such as NHTs, NHLs, properties listed in the National Register, and TCPs.

Still, the paucity of inventories and proactive tribal consultation conducted for the SEZs precludes us from wholeheartedly endorsing the SEZ alternative as is and from identifying all of our potential concerns with the SEZs here. Therefore, we propose adjustments to the boundaries of several SEZs based on known cultural resource issues and we recommend additional steps for refining the SEZs and for avoiding conflicts with significant cultural resources.

Recommendations:

- **The BLM should carefully consider the impacts of certain SEZs to cultural resources and adjust the SEZ boundaries, as appropriate.**

  - ***Dry Lake (NV):*** As currently drawn, the southeastern portion of the SEZ encompasses the Old Spanish Trail/Mormon Road site, which is listed in the National Register as a district, and comes close to the trail

itself. ***We recommend that the BLM move the southeastern boundary of the SEZ to the west of I-15 to help reduce impacts to the trail and associated sites.***

- ***Fourmile East (CO):*** As currently drawn, the eastern edge of the Fourmile East SEZ in Colorado comes within one mile of the Old Spanish NHT. Additionally, the SEZ overlays the Los Caminos Antiguos Scenic Byway. The PEIS acknowledges that at least 12 miles of the Old Spanish NHT would be adversely affected by solar development. Furthermore, the PEIS recommends that solar development on the east side of the byway (in this area, State Highway [SH] 150) not be approved, in order to reduce adverse impacts to the byway's eastern viewshed and to the NHT. PEIS at 10.3-28. Accordingly, ***we recommend that the BLM move the eastern boundary of the SEZ to some distance (e.g., at least 0.25 miles) west of SH 150.***

- ***Riverside East (CA):*** As currently drawn, the west end of the Riverside East SEZ in California nearly surrounds a portion of Joshua Tree National Park. This nationally significant landscape contains important cultural and natural resources, as well as high scenic values, all of which could be severely impacted by adjacent solar development. ***We recommend that the BLM redraw the western boundary of this SEZ so that, at a minimum, the SEZ is located completely east of SR 177.*** This will greatly reduce the potential visual impacts to Joshua Tree National Park's significant cultural and natural resources.

- ***De Tilla Gulch (CO):*** The southern boundary of this SEZ is located only 0.25 miles from the Old Spanish NHT and a segment of the trail may actually run through the SEZ. Of the portion of trail that runs immediately south of the SEZ, the PEIS states, "Pending completion of a study on the significance and definition of management needs (if any) of the trail, solar development should be restricted to areas that do not have the potential to adversely affect the setting of the trail." PEIS at 10.2-5. Given the small size of the SEZ and its proximity to the trail, however, it is doubtful whether the SEZ could be developed in a way that would avoid adversely affecting the tread and/or setting of the trail. Therefore, we recommend, at a minimum, that the BLM require a combination of mitigation measures to minimize impacts to high potential route segments located within the SEZ viewshed. Examples of mitigation measures could include, for example, restrictions on the height of solar development; painting of solar structures to reduce visibility; and contribution of educational or land purchase funds for off-site activities. This recommendation applies to both the known high potential route segment located southeast of the SEZ and to any additional segments the BLM may identify during its current inventory

work close to the SEZ. Potential developers should be aware that there would likely be high mitigation costs for projects within this SEZ because adverse impacts to nationally significant trail resources could not be avoided. Given the large number of potential conflicts between solar development and NHT preservation in this area, ***we urge the BLM to consider removing this SEZ from development.***

- ***Afton (NM):*** This SEZ has the potential to visually impact dozens of miles of the El Camino Real NHT and Scenic Byway and the Butterfield Trail Scenic Byway. While the settings of the relevant portions of these trails and byways have already been somewhat impacted by I-25 and an adjacent railroad line, ***we urge BLM to use a variety of mitigation measures to avoid or reduce visual impacts*** to any unaltered high potential historic sites and route segments of these nationally significant resources. In addition, ***we recommend that the BLM prevent development in dune areas within the SEZ***, as these are likely to contain concentrations of historic properties. ***We also urge the BLM to take into consideration the visual impacts*** of development within the SEZs on the many cultural areas of critical environmental concern and special recreation management areas that surround the SEZ, as they contain numerous significant prehistoric habitation and rock art sites.

- ***Red Sands (NM):*** Sacred to various Native American Tribes, Lone Butte is actually encompassed by the proposed Red Sands SEZ. The same SEZ is surrounded by other sacred mountains, including San Andrews (21 miles to the west), Sacramento (7 miles to the east), and White (39 miles to the north-northeast). PEIS at 12.3-13. The BLM should work closely with the appropriate Tribes to determine whether development of this SEZ could cause adverse impacts to sacred viewsheds, and whether those impacts could be adequately mitigated. If they could not be, ***the BLM should consider modifying the SEZ boundaries or excluding the Red Sands SEZ altogether***.

VI. Several directives for identifying and protecting cultural resources are missing from both action alternatives.

As stated above, we favor the SEZ alternative, but we do not support the preferred alternative. Nonetheless, both action alternatives should include the following additional directives pertaining to cultural resources:

Recommendations:

- **The BLM should describe the process for creating additional SEZs.**

  While the 24 currently proposed SEZs should provide far more land for solar energy development than will be needed over the next decades, we understand that other lands outside the current SEZs may be appropriate for SEZ designation and subsequent project development. Therefore, in the Final PEIS, the BLM should outline a process for designating new SEZs, as appropriate, in the future. This will ensure that only the lands with the best solar resources and the fewest conflicts with cultural and natural resources will be made available for utility-scale development. By creating a rigorous process for SEZ additions, the BLM will help to ensure that our nation can meet its future energy needs with projects that can be developed and implemented successfully, without sacrificing our cultural and natural heritage. At a minimum, ***we request that the BLM conduct Class II surveys of potential future SEZs*** to help identify—and then avoid through SEZ boundary modifications—potential impacts to significant cultural resources.

- **The BLM should specify exactly what "limited additional environmental review" is, in contrast with "in-depth environmental analysis."**

  In multiple locations, the PEIS states that, because in-depth analyses have already been performed for the SEZs, or would be for future SEZs, project-specific resource analysis could or would be performed at a limited or lower level. See PEIS at 1.17, 2.13. In the Final PEIS, the BLM should outline what such limited environmental reviews would consist of and exactly when they would be used in lieu of more thorough analyses. The PEIS should clearly state that project-specific National Environmental Policy Act (NEPA) and NHPA reviews will still be conducted, regardless of the projects' locations, as required by law. However, if the BLM means that Environmental Assessments (as opposed to EISs) would be used to assess the impacts of projects located in SEZs, the Final PEIS should state that explicitly.

- **As part of the development of the PEIS, the BLM should conduct at least Class II surveys in areas for which no cultural resource inventories and/or tribal consultation have yet been completed.**

  For at least seven of the proposed SEZs, less than 1% of the land has already been surveyed for cultural resources. And for thirteen other proposed SEZs, less than 5% of the land has already been surveyed. We assume that lands outside the SEZs generally have had a similar paucity of cultural resource inventories. This low level of information about the location of cultural

resources is completely inadequate for assessing potential impacts to historic properties under both NEPA and Section 106 of the NHPA. Therefore, we urge the BLM to conduct at least reconnaissance level (Class II) surveys of uninventoried solar development priority areas—including both the SEZs and areas outside them—prior to issuing the Final PEIS, in order to better determine what historic properties might be present. By identifying areas of significant cultural resources from the outset, and then directing projects to areas that do not contain them, the BLM can help to ensure that projects will be completed successfully and efficiently, while minimizing impacts to significant cultural resources.

Findings from these Class II surveys should be used to help identify exclusion areas, as well as to develop predictive models about the distributions of cultural resources. They should not, however, be used as substitutes for intensive Class III surveys conducted as part of project-specific NEPA and NHPA reviews. BLM Manual 8100, which concerns managing cultural resources, cites the use of Class II reconnaissance surveys to "[develop] recommendations about further inventory needs in previously unsurveyed areas." Glossary at 7. Furthermore, BLM Manual 8110 provides great detail about the use of Class II field surveys to identify and evaluate cultural resources. It states:

> A class II survey is most useful for improving cultural resource information in a large area, such as for planning or EIS purposes, where insufficient systematic identification work has been done in the past . . . Class II survey may be appropriate when comparing alternative locations for proposed undertakings . . . [and] when class I data are found to be biased or otherwise insufficient to allow for reasoned judgments during general land use planning or activity planning.

BLM Manual 8110 at .21B. These situations are exactly those presented by the SEZs and other areas open to solar energy development under the preferred alternative; the vast majority of these areas have not been surveyed for cultural resources, but knowledge of resource locations is vital for evaluating potentially appropriate locations for solar energy projects.

- **The PEIS should more thoroughly evaluate noise, light and cumulative impacts to cultural resources.**

The significance of some cultural resources, including NHTs and TCPs, depends in large part on atmospheric integrity and historically appropriate setting. Accordingly, Chapter 5 of the PEIS should more explicitly

acknowledge the potential impacts of noise and light on these and other cultural resources.

Likewise, potential cumulative impacts to significant cultural resources should be outlined more thoroughly. The PEIS states that "Cumulative effects on cultural resources from foreseeable development in the six-state region are expected to be small because of the relatively small fraction of total land disturbed." PEIS at 6-100. However, this statement does not acknowledge (as other sections of the PEIS do) the potentially significant and far-ranging impacts that solar energy development, particularly outside the SEZs, could have on linear resources such as NHTs and scenic byways, whose historic character and scenic value are highly dependent upon the integrity of the landscape and setting surrounding the corridors.

- **The BLM should require, not just recommend, the use of specific measures for avoiding, minimizing, and/or mitigating impacts to significant cultural resources.**

  The state-specific chapters of the PEIS propose some well-developed design features for avoiding, minimizing, and/or mitigating impacts to specific kinds of cultural resources, particularly NHTs. See PEIS at 10.3-15 and 10.3-28. In order to ensure that impacts truly are avoided, minimized, and/or mitigated, these design features should be required, not simply recommended. This would not only better protect the resources but provide greater certainty for project steps and ultimate success.

- **Prior to finalizing the PEIS, the BLM should develop a plan to systematically inventory all segments of National Historic Trails (NHTs) and candidate NHTs that are located within the viewsheds of approved solar development areas and SEZs.**

  Under the statute establishing the National Trails System, , high potential historic sites are "those historic sites related to the route, or sites in close proximity thereto, which provide opportunity to interpret the historic significance of the trail during the period of its major use." The criteria for identifying high potential sites include "historic significance, presence of visible historic remnants, scenic quality, and relative freedom from intrusion." 16 U.S.C. § 1251(1). Similarly, high potential route segments are "those segments of a trail which would afford high quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route." *Id*. § 1251(2). Because high potential historic sites and route segments are identified as such precisely because of their greater than

average scenic values, and relative freedom from intrusion, those values must be protected to maintain the integrity of the sites and segments. Sites and segments of NHTs that are eligible for or listed on the National Register of Historic Places generally also feature significant viewsheds. Therefore, trail sites, viewsheds and settings must be preserved. National Register Bulletin 30, "Guidelines for Evaluating and Documenting Rural Historic Landscapes," may enhance identifications of NHT landscapes and significances. See Bulletin 30 at 27.
The PEIS itself says,

> Because the landscape setting observed from units of the National Park system, national historic sites, national trails, and Tribal cultural resources may be a part of the historic context contributing to the historic significance of the site or trail, project siting should avoid locating facilities that would alter the visual setting in a way that would reduce the historic significance or function, even if compliant with VRM objectives. This requirement does not supersede or amend national historic sites, national trails, and Tribal cultural resources requirements cited in other sections, but is in addition to and supportive of them.

PEIS at 5-193. Accordingly, in order to better avoid impacts to NHTs and to better ensure project success, the BLM should attempt to identify all high-potential historic sites and route segments and National Register-eligible sites and segments of NHTs that could be visually or otherwise impacted by solar energy development.

- **The BLM should prescribe specific additional avoidance and/or mitigation measures for certain areas and cultural resources.**

We commend the BLM for establishing protective buffers around NHTs, but a standard buffer of 0.25 miles on either side of a trail corridor centerline is generally inadequate for protecting both the physical traces and settings of the trails. Some historic trail corridors themselves are actually wider than 0.25 or even 0.5 miles, and many have sweeping vistas and landscapes that are an important part of the setting, so this minimal buffer is far too narrow in those cases. In other locations, where trail segments have already lost integrity, a 0.25 mile buffer may not be necessary. Therefore, as an alternative, we urge the BLM to identify trail avoidance areas using ***viewshed analyses*** around high potential historic sites and route segments and National Register-eligible and -listed sites and segments, rather than standard linear zones. This approach first requires trail inventories and eligibility assessments to identify such

segments. At an absolute minimum, viewshed analyses and visual simulations should be conducted as elements of NEPA analyses for all projects proposed within 5 miles of NHTs, to guide project locations to the places that are least harmful to the trails.

If viewshed analyses are not possible, we recommend that BLM exclude from solar development all areas located within 5 miles of high potential historic sites and route segments and National Register-eligible and -listed sites and segments of NHTs. The five-mile buffer zone should specifically prohibit photovoltaic systems, parabolic troughs, and dish engine technologies. If power towers are to be used, we recommend that the exclusion corridor be expanded to 7 miles on each side of these significant sites and segments of NHTs. At a minimum, development should be severely limited within NHT corridors—particularly for high potential historic sites and route segments—and visual and other impacts should be stringently minimized and mitigated, according to distance and level of impact. These measures will support preservation of the historic viewsheds and settings that are vital to the trails' national significance, while largely removing potential conflicts with and hurdles for development.

In addition to the 0.25-mile exclusion corridor, the PEIS itself recommends development far from NHTs in order to minimize impacts to NHTs. See PEIS at 10.1-6, 12.1-5. Furthermore, the PEIS states that, "Because the landscape setting observed from units of the National Park system, national historic sites, national trails, and Tribal cultural resources may be a part of the historic context contributing to the historic significance of the site or trail, project siting shall avoid locating facilities that would alter the visual setting in a way that would reduce the historic significance or function, even if compliant with VRM objectives." PEIS at A-79. Therefore, it would seem that creating wider exclusion corridors for NHTs would help to build more certainty into the solar development process, both for trail protection and for project development.

Furthermore, as defined in the National Trails System Act, NHTs have a combination of historic and recreational elements. As such, trails should also be thought of in relation to sections of the PEIS that prescribe measures to avoid impacts to recreation areas. For example, in Appendix A regarding development policies and design, the PEIS specifically states that "Solar facilities shall not be placed in areas of unique or important recreation resources. " PEIS at A-39. While the extent of these "areas" is undefined, NHTs should be considered in this context, as well. The PEIS should also acknowledge that increases in ambient noise level could have a negative effect on all recreational uses, including people traveling in the vicinity of

NHTs. In addition, because trails generally run through terrain that's easiest to traverse, the PEIS should explicitly consider cumulative impacts to low-elevation, not just high-elevation, recreation areas.

Because NHTs may still be affected by solar energy development, the PEIS should also include recommendations for off-site mitigations, including acquiring new trail easements not already on public lands, documenting pre-development landscapes through photographs and data collection as a form of "data recovery," developing interpretive sites, and creating history and outdoor education curricula for schools. The PEIS should also acknowledge the potential need for the establishment of alternative (substitute) trail corridors to maintain the integrity of trail networks if recreation and visitation of sections of NHT are interrupted by solar development.

- **The BLM should conduct additional government-to-government consultation with Native American tribes prior to finalizing the PEIS, to identify additional lands for exclusion.**

  We commend the BLM for identifying in the PEIS some TCPs and other areas that are sacred to Tribes. Still, we strongly encourage the BLM to consult with Tribes to identify additional areas that should be excluded from solar energy development, particularly under the preferred alternative. Impacts to TCPs and sacred areas generally are very difficult to mitigate so avoidance of these areas will result in greater certainty for both project proponents and Tribes.

VII. Conclusion

We greatly appreciate the opportunity to comment on the PEIS, which represents a proactive effort to ensure that solar energy development on BLM lands is planned in a way that avoids unnecessary impacts to significant historic places in America. We feel strongly that BLM can fulfill its mandate to protect America's outstanding historic and cultural resources while meeting its goal to support and sustain the renewable energy economy. We urge BLM to adopt the SEZ alternative, which has clearly emerged as the most reasonable approach for achieving America's renewable energy goals while limiting the risks of damage to the nation's heritage.

Thank you for your comment, Chase Huntley.

The comment tracking number that has been assigned to your comment is SolarD11811.

Comment Date: May 2, 2011 13:59:50PM
Solar Energy Development PEIS
Comment ID: SolarD11811

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Privacy Preference: Don't withhold name or address from public record
Attachment: Solar DPEIS Programmatic Comment Letter (TWS and partners) 05012011.pdf

Comment Submitted:

Please accept and fully consider these comments on behalf of The Wilderness Society, Natural Resources Defense Council, Defenders of Wildlife, Sonoran Institute, Wild Utah Project, New Mexico Wilderness Alliance, Tucson Audubon Society, Audubon Wyoming, Friends of Ironwood Forest, Arizona Wilderness Coalition, Southern Utah Wilderness Alliance, California Wilderness Coalition, Nevada Conservation League & Education Fund, Nevada Wilderness Project, Audubon New Mexico, Soda Mountain Wilderness Council, Center for Native Ecosystems, Western Environmental Law Center, Californians for Western Wilderness, Gila Resources Information Project, Gila Conservation Coalition, National Audubon Society, San Luis Valley Ecosystem Council, and the Sierra Club.

We appreciate the opportunity to submit these comments to the Bureau of Land Management on the draft Programmatic Environmental Impact Statement (PEIS) for agency-wide solar energy program and policy. We are submitting these comments today via the Argonne National Lab website.

To achieve the President's and Secretary's visions of sustainable, environmentally responsible renewable energy development, particularly solar energy, our organizations urge BLM to adopt a Modified Solar Energy Zone (SEZ) Program Alternative that would take into account the general approach of the SEZ Alternative while ensuring SEZs are truly prioritized for development and defining the process for continuing to evaluate and add to SEZs. The Modified SEZ Program Alternative we propose would incorporate the following key elements:

• Utility-scale development is limited to SEZs identified in the PEIS and designated in the Record of Decision (ROD), which would be modified from the Draft PEIS in accordance with additional comments and recommendations. Some of our recommendations on the particular Solar Energy Zones are contained in state-specific comments submitted by some of our groups under separate covers. SEZs designated in the final PEIS require additional site-specific NEPA analysis.
• Additional SEZs may be designated based on determinations of need and in accordance with the criteria and more detailed process set out below. A need has already been demonstrated for additional SEZs in California and we urge BLM to continue review of the West Chocolate Mountains site and initiate analysis of a West Mojave SEZ, based on feedback submitted by some of our groups last year, immediately. Similarly, additional SEZs are needed in Arizona and Arizona BLM's on-going Restoration Energy Design Project should be used to identify potential new SEZs. The need for new SEZs should be analyzed at least every five years. Future SEZs would be fully analyzed at the time of designation to ensure they take a hard look at key issues, including wildlife, cultural resources, transmission, and cumulative impacts, and thus could allow project permitting with tiered NEPA analyses.
• Applications filed before June 30, 2009 (the date the BLM made maps of Solar Energy Study Areas available) would be processed subject to current BLM guidance, including meaningful screening of applications according to Instruction Memorandum Number 2011-061 (which should be modified to reflect the consensus recommendations of the California Desert Renewable Energy Working Group attached as Appendix IX) and others; projects would then be prioritized for processing starting with those having the fewest conflicts. BLM would extinguish all applications located on lands excluded from development under the final PEIS. New applications and those filed on or after June 30, 2009, will be restricted to zones.

Over the last few years, several of our organizations have worked closely with the BLM, industry representatives, utility representatives and others to address the challenges of guiding solar energy development to the right places, taking into account technical, environmental, cultural, transmission, and other needs. We have seen first-hand how difficult it is for BLM to extinguish

applications that are submitted for the wrong places, and how speculative applications further complicate the process of moving appropriately-sited projects forward. We know also that permitting projects of the scale and intensity of these solar energy projects is difficult anywhere in the desert. And we have worked hard to improve and support projects, and to help developers and utilities understand the opportunities and limitations for additional development in our wild, fragile deserts.

Based on these experiences, we believe the Modified SEZ Program Alternative provides a clear, effective path from the current situation to a world where projects and transmission are sited expeditiously in the areas of high energy resource and least environmental impact. In addition to facilitating BLM's permitting, it can help utilities and other entities plan for needed transmission to meet renewable portfolio standards and other renewable energy goals.

We appreciate your serious consideration of these comments and urge you to adopt the Modified SEZ Program Alternative. We look forward to continuing to work with you to develop a Solar Energy program for BLM lands that moves forward our goals of clean air, reduced greenhouse gas emissions, and protection of our nation's great western desert ecosystems.

May 1, 2011

Mr. Bob Abbey
Director, Bureau of Land Management
Solar Energy PEIS
Argonne National Laboratory
9700 South Cass Avenue
EVS/240
Argonne, IL 60439

Dear Mr. Abbey:

Please accept and fully consider these comments on behalf of The Wilderness Society, Natural Resources Defense Council, Defenders of Wildlife, Sonoran Institute, Wild Utah Project, New Mexico Wilderness Alliance, Tucson Audubon Society, Audubon Wyoming, Friends of Ironwood Forest, Arizona Wilderness Coalition, Southern Utah Wilderness Alliance, California Wilderness Coalition, Nevada Conservation League & Education Fund, Nevada Wilderness Project, Audubon New Mexico, Soda Mountain Wilderness Council, Center for Native Ecosystems, Western Environmental Law Center, Californians for Western Wilderness, Gila Resources Information Project, Gila Conservation Coalition, National Audubon Society, San Luis Valley Ecosystem Council, and the Sierra Club.

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- Utility-scale development is limited to SEZs identified in the PEIS and designated in the Record of Decision (ROD), which would be modified from the Draft PEIS in accordance with additional comments and recommendations. Some of our

recommendations on the particular Solar Energy Zones are contained in state-specific comments submitted by some of our groups under separate covers. SEZs designated in the final PEIS require additional site-specific NEPA analysis.

- Additional SEZs may be designated based on determinations of need and in accordance with the criteria and more detailed process set out below. A need has already been demonstrated for additional SEZs in California and we urge BLM to continue review of the West Chocolate Mountains site and initiate analysis of a West Mojave SEZ, based on feedback submitted by some of our groups last year, immediately. Similarly, additional SEZs are needed in Arizona and Arizona BLM's on-going Restoration Energy Design Project should be used to identify potential new SEZs. The need for new SEZs should be analyzed at least every five years. Future SEZs would be fully analyzed at the time of designation to ensure they take a hard look at key issues, including wildlife, cultural resources, transmission, and cumulative impacts, and thus could allow project permitting with tiered NEPA analyses.
- Applications filed before June 30, 2009 (the date the BLM made maps of Solar Energy Study Areas available) would be processed subject to current BLM guidance, including meaningful screening of applications according to Instruction Memorandum Number 2011-061 (and others); projects would then be prioritized for processing starting with those having the fewest conflicts.[1] BLM would extinguish all applications located on lands excluded from development under the final PEIS. New applications and those filed on or after June 30, 2009, will be restricted to zones.

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Based on these experiences, we believe the **Modified SEZ Program Alternative** provides a clear, effective path from the current situation to a world where projects and transmission are sited expeditiously in the areas of high energy resource and least environmental impact. In

[1] IM 2011-061 should be modified to reflect the consensus recommendations of the California Desert Renewable Energy Working Group to the Secretary of the Interior dated December 22, 2010, and attached as Appendix IX.

addition to facilitating BLM's permitting, it can help utilities and other entities plan for needed transmission to meet renewable portfolio standards and other renewable energy goals.

We appreciate your serious consideration of these comments and urge you to adopt the Modified SEZ Program Alternative. We look forward to continuing to work with you to develop a Solar Energy program for BLM lands that moves forward our goals of clean air, reduced greenhouse gas emissions, and protection of our nation's great western desert ecosystems.

Sincerely,

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Response to the

Draft Programmatic Environmental Impact Statement for

Solar Energy Development

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INTRODUCTION

Over the last few years, several of our organizations have worked closely with the BLM, industry representatives, utility representatives and others to address the challenges of guiding solar energy development on public lands to the right places, taking into account technical, environmental, cultural, transmission, and other needs. We have seen first-hand how difficult it is for BLM to extinguish applications that are submitted for the wrong places, and how speculative applications further complicate the process of moving appropriately-sited projects forward. We have worked hard to improve and support projects, and to help developers and utilities understand the opportunities and limitations for additional development in our wild, fragile desert ecosystems.

Based on these experiences and our decades of work to improve the protection and management of our public lands, we have outlined in these comments a **Modified SEZ Program Alternative** to provide a clear, effective path from the current situation to a world where projects and transmission are sited expeditiously in the areas of high energy resource and least environmental impact. In addition to facilitating BLM's permitting, it can help utilities and other entities plan for needed transmission to meet renewable portfolio standards and other renewable energy goals.

Through the Solar PEIS, the BLM is undertaking a new program. Our organizations urge BLM to adopt a **Modified SEZ Program Alternative,** instead of the preferred alternative. This modified alternative takes into account the general approach of the SEZ Alternative while ensuring SEZs are truly prioritized for development and defining the process for continuing to evaluate and add to SEZs. The **Modified SEZ Program Alternative** we propose would incorporate the following key elements:

- Utility-scale development is limited to SEZs identified in the PEIS and designated in the Record of Decision (ROD), which would be modified from the Draft PEIS in accordance with additional comments and recommendations. Most of our recommendations on the particular Solar Energy Zones are contained in state-specific comments submitted by some of our groups under separate covers and incorporated here by reference.[2] SEZs designated in the final PEIS require additional site-specific NEPA analysis.
- Additional SEZs may be designated based on determinations of need and in accordance with the criteria and more detailed process set out below. A need has already been demonstrated for additional SEZs in California and we urge BLM to continue review of the West Chocolate Mountains site and initiate analysis of a West Mojave SEZ, based on feedback submitted by some of our groups last year, immediately. Similarly, additional SEZs are needed in Arizona and Arizona BLM's on-going Restoration Energy Design Project should be used to identify potential new

[2] See: Solar DPEIS – Comments – Arizona Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – Colorado Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – New Mexico Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – Nevada Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – Utah Final (TWS and partners 4-18-11)
Solar DPEIS - Comments – California (NRDC and partners)

SEZs. The need for new SEZs should be analyzed at least every five years. Future SEZs would be fully analyzed at the time of designation to ensure they take a hard look at key issues, including wildlife, cultural resources, transmission, and cumulative impacts, and thus could allow project permitting with tiered NEPA analyses.

- Applications filed before June 30, 2009 (the date the BLM made maps of Solar Energy Study Areas available) would be processed subject to current BLM guidance, including meaningful screening of applications according to Instruction Memorandum Number 2011-061 (and others); projects would then be prioritized for processing starting with those having the fewest conflicts.[3] BLM would extinguish all applications located on lands excluded from development under the final PEIS. New applications and those filed on or after June 30, 2009, will be restricted to zones.

SECTION 1. DOI ACTION

I. Make it meaningful

Through the Solar PEIS, the BLM is undertaking a new program, which the BLM has described as:

> [R]eplacing certain elements of [BLM's] existing solar energy policies (described above) with a comprehensive Solar Energy Program that would allow the permitting of future solar energy development projects to proceed in a more efficient and standardized manner. While the proposed Solar Energy Program will further the BLM's ability to meet the mandates of E.O. 13212 and the Energy Policy Act of 2005, it also has been designed to meet the requirements of Secretarial Order 3285A1 (Secretary of the Interior, 2010) related to identifying and prioritizing specific locations best-suited for utility-scale solar energy development on public lands.

According to the Draft Solar PEIS, the "BLM is developing this PEIS to evaluate a proposed program to further support utility-scale solar energy development on BLM-administered lands." DPEIS, p. 1-7. In addition:

> The anticipated elements of the BLM's proposed Solar Energy Program include:
>
> 1. Identification of lands excluded from utility-scale solar energy development in the six-state study area;
>
> 2. Identification of priority areas within the lands open to solar energy development that are best suited for utility-scale production of solar energy in accordance with the requirements of Secretarial Order 3285A1 (i.e., proposed SEZs);
>
> 3. Establishment of mitigation requirements for solar energy development on public lands to ensure the most environmentally responsible development and delivery of solar energy; and

[3] IM 2011-061 should be modified to reflect the consensus recommendations of the California Desert Renewable Energy Working Group to the Secretary of the Interior dated December 22, 2010, and attached as Appendix IX.

4. Amendment of BLM land use plans in the six-state study area to adopt those elements of the new Solar Energy Program that pertain to planning.

DPEIS, p. 1-8.
In order to ensure that the Solar PEIS will provide an effective tool for managing development of solar energy on the public lands, the BLM needs to further delineate and expand discussions of the key aspects of this program as discussed below.

A. ***Solar Energy Zones***

1. Solar Energy Zones are a key element of the proposed program.

The Draft PEIS defines a Solar Energy Zone (SEZ) as "an area with few impediments to utility-scale production of solar energy where BLM would prioritize solar energy and associated transmission infrastructure development." DPEIS, p. 2-10. The SEZs were identified based on solar resources, existing transmission and infrastructure, minimum size, lack of slope, screening out units of the National Landscape Conservation System and other classes of lands with high sensitivity and/or conservation values, and taking into account local conditions, institutional knowledge, and other ongoing coordination efforts. DPEIS, p. 2-10.

The general criteria used to identify SEZs will support the goals of the BLM's program by helping to identify lands best-suited for utility-scale development. However, as discussed in detail in specific comments on each SEZ that have been submitted separately,[4] some of the proposed SEZs encompass lands that are not suited for large-scale development and either should not be designated or should be re-drawn to protect sensitive lands and resources. Further, additional analysis of certain resources will be required to define acceptable SEZs. For example, the Draft PEIS acknowledges that identification of areas of Tribal concern was not completed prior to publication (DPEIS, p. 2-10), and notes that additional information regarding the impacts on wildlife remains to be provided.

Nonetheless, the identification of priority areas for industrial-scale energy development is key to guiding development to suitable areas, as well as to keeping such development out of inappropriate areas.

2. BLM should adopt a **Modified SEZ Program Alternative** to make SEZs and the BLM's solar energy development program more meaningful than the Preferred Alternative.

The BLM's preferred Solar Energy Development Program Alternative (Preferred Alternative) will not meet the objectives of the PEIS, including as set forth in the Purpose and Need Statement, or the BLM's program. It would make available 21.5 million acres of land for utility-

[4] See: Solar DPEIS – Comments – Arizona Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – Colorado Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – New Mexico Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – Nevada Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – Utah Final (TWS and partners 4-18-11)
Solar DPEIS - Comments – California (NRDC and partners)

scale energy development, in addition to designated Solar Energy Zones (SEZs). *See*, DPEIS, Table 2.2-1, p. 2-3. The Preferred Alternative would incorporate SEZs only as areas where utility-scale solar development would be prioritized, but would not actually limit development to these areas. While the Draft PEIS discusses general approaches for directing development to SEZs, these measures are not sufficient to ensure that the SEZs will actually be prioritized by developers or the BLM.

The additional lands that would be made available have not been sufficiently analyzed to justify making them available for industrial levels of development. For instance, the BLM acknowledges that, when considering impacts to special status species, the Draft PEIS has only evaluated data in what are termed the "SEZ regions" that are defined as within 50 miles of SEZ centers. Draft PEIS, p. J-2. The Preferred Alternative, if adopted as proposed, would impact more than 400 rare, sensitive, candidate, state-listed and federally-protected plants and animals.

In contrast to the Preferred Alternative's 21.5 million acres, the SEZs have been subjected to more analysis and, as modified in accordance with recommendations set out in separate comments,[5] are better suited to industrial-scale solar energy development.

In order to actually guide utility-scale development to the most appropriate places on public lands, new applications should be limited to the SEZs designated through this PEIS process, and new or expanded SEZs that are designated, as needed, through the process laid out in these comments.

BLM should adopt a **Modified SEZ Program Alternative** that would take into account the general approach of the SEZ Alternative while ensuring SEZs are truly prioritized for development and defining the process for continuing to evaluate those SEZs. The Modified SEZ Alternative would incorporate the following key elements:

a. Utility-scale development is limited to SEZs identified in the PEIS and designated in the Record of Decision (ROD), which would be modified from the Draft PEIS in accordance with additional comments and recommendations.
b. Additional SEZs could be designated based on determinations of need and in accordance with the criteria and more detailed process set out below.
c. Applications filed before June 30, 2009 (the date the BLM made maps of Solar Energy Study Areas available) would be processed subject to current BLM guidance, including , including meaningful screening of applications according to Instruction Memorandum Number 2011-061 (and others).[6] Applications filed on or after June 30, 2009 will be subject to the zone-based solar energy program set out in the PEIS and modified in accordance with these comments.

Our proposed approach to expanding or adding SEZs is set out in more detail in Section 1.I.B.2: Modify the SEZ Alternative to include a process for adding new zones, below.

[5] Ibid.
[6] IM 2011-061 should be modified to reflect the consensus recommendations of the California Desert Renewable Energy Working Group to the Secretary of the Interior dated December 22, 2010, and attached as Appendix IX.

While limiting development to SEZs is evaluated in the SEZ Program Alternative, it is also consistent with a modification to the Preferred Alternative. Both action alternatives contemplate prioritizing development in SEZs as well as adding additional zones. Neither, however, includes a process for doing so beyond noting that "[c]hanges to SEZs would have to go through a land use planning process, which would be subject to the appropriate environmental analysis." DPEIS, pp. 2-11, 2-14. Both alternatives do provide for amendments to affected land use plans: identifying lands in SEZs, identifying lands excluded from development, and for remaining areas available, would also adopt the policies and design features developed in the Solar PEIS. DPEIS, p. C-1. Accordingly, further defining the process by which additional SEZs would be designated or existing SEZs expanded and then incorporated into the affected plans is consistent with the SEZ Alternative's approach.

3. The **Modified SEZ Program Alternative** would provide sufficient production of energy from solar development on the public lands.

As discussed in the Draft PEIS, two methods were used to evaluate a Reasonably Foreseeable Development Scenario (RFDS), estimating the amount of power projected to be generated. The RFDS, as applied for the next 20 years, is the same for both BLM action alternatives – the Preferred Alternative and the SEZ Program Alternative. DPEIS, p. 2-23. The RFDS is sufficient to meet BLM's goals for production of solar energy from the public lands DPEIS, Table 2.4-2, p. 2-22. Further, an independent analysis of the methodology shows that the RFDS is actually aggressive both in terms of amount of renewable energy needed in the study area through 2030 and in terms of the amount of solar energy the public lands will provide to meet that need and, yet, that the alternatives set out in the Draft PEIS will be able to meet those needs and generation goals.

Further, the independent review concluded that the two methods used to arrive at the RFDS were appropriate tools, supporting the conclusion that the RFDS provides a reasonable basis for projecting the *maximum* development that might occur for the purpose of projecting impacts at the programmatic level. We have attached this analysis as Appendix I. We expect that, based on recommendations for modifying SEZs and for adding new SEZs, the **Modified SEZ Program Alternative** would also meet the agency's goals.

Recommendations: SEZ are necessary to provide for targeted development of solar energy on the public lands in a manner that can use high-quality resources while avoiding lands with high conservation values and limiting damage to other natural resources. The PEIS should ensure that utility-scale development is guided to SEZs and set out a process for designating additional lands as SEZs (including associated criteria) when such capacity is needed through adopting a **Modified SEZ Program Alternative**.

B. ***Zone-based Solar Energy Program through adoption of the Modified SEZ Program Alternative.***

Appendix A to the Draft Solar PEIS sets out "Current and Proposed Bureau of Land Management Solar Energy Development Policies and Design Features." These policies will be

incorporated into all of the affected RMPs and, therefore, are a key element of any Solar Energy Program. The Solar Energy Development Policies and Design Features should be improved in the following ways and adopted as part of a **Modified SEZ Program Alternative**:

At the outset, the ROD and land use plan amendments must be absolutely clear that application of the policies and design features is *mandatory*, subject to applicability to specific site conditions.

The actual text of IMs 2010-071, 2010-141, 2011-003, 2011-059, 2011-060, and 2011-061 should be included, to avoid confusion with the status of this guidance as time passes.[7]

The text of the guidance issued by the Council on Environmental Quality on January 14, 2011, addressing the "Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact," should be incorporated.

BLM should adopt a final, effective **Modified SEZ Program Alternative** that incorporates the following modifications of the Draft PEIS SEZ Alternative:

1. Modify the SEZ Alternative set out in the Draft PEIS to provide for three categories of land designation for solar energy development.

The basis for solar energy development on BLM lands is the underlying Resource Management Plan (RMP). The PEIS seeks to amend 89 RMPs to address solar energy development. The final Solar Energy Program adopted by BLM must have the following three categories of land designation for solar energy development.

a. Category 1: Lands made available for solar development. RMPs underlying designated Solar Energy Zones will be amended to be made available for solar development.

Within SEZs, RMP amendments should affirmatively make that acreage available for solar energy development pending adequate environmental analysis.

b. Category 2: Lands not excluded from solar development. RMPs underlying lands outside SEZs designated as “not excluded from solar energy development” (referred to in the Draft PEIS as “available lands”) will be available for further study and potential future designation of new or expanded zones.

The lands not excluded from solar energy development, but not designated as zones, in the DPEIS should be designated as such in the **Modified SEZ Program Alternative**. These are the 21.5 million acres identified in the Draft PEIS as “available land.” They should be modified to exclude additional sensitive resources as recommended in state specific comments, especially

[7] IM 2011-061 should be modified to reflect the consensus recommendations of the California Desert Renewable Energy Working Group to the Secretary of the Interior dated December 22, 2010, and attached as Appendix IX.

Citizen Wilderness Proposals and lands set aside for mitigation.[8] These lands should not be made available for development in the ROD but, rather, should serve as the universe of lands from which new or expanded zones can be designated under the reassessment process described in Section 1.I.B.2: Modify the SEZ Alternative to include a process for adding new zones, below, and subject to specific criteria laid out in Appendix VII. Although pending applications may be located in these lands in some states, new applications shall not be accepted on these lands unless and until they are designated zones. Pending applications should be defined to include only those filed by June 30, 2009, to avoid potential gaming of the system between now and the date of the ROD.

c. Category 3: Lands excluded from solar energy development. RMPs underlying remaining 180+ million acres will be amended to exclude solar development.

Where lands have been found not suitable and excluded from solar development under both DPEIS action alternatives, RMPs should be amended to exclude solar energy development under the modified SEZ Alternative. Importantly, **pending applications, regardless of filing date, located in whole or in part in lands excluded from solar energy development should be rejected upon issuance of the ROD**.

The exclusions listed in DPEIS Table 2.2-2 (reproduced following) should be reflected in RMP amendments. However, when considering future zones, an exception should be made for Desert Renewable Energy Planning Process (DRECP). In that process, the BLM should continue to examine **all lands** previously identified within the DRECP planning process as lands potentially available for development. While some lands may become "unavailable" for development upon finalization of the PEIS, the BLM could amend the RMPs within the DRECP area to make some of those lands "available" upon finalization of the DRECP. In particular, we believe that there are potentially suitable lands for development with the West Mojave and Imperial Valley that are not currently identified by the BLM in the PEIS as "available lands." Further, if the BLM issues a scoping notice for potential solar zone(s) within the West Mojave prior to the finalization of the PEIS, the BLM should continue with the examination of those areas for possible RMP amendment after the finalization of the PEIS.

DPEIS TABLE 2.2-2 Areas for Exclusion under the BLM Solar Energy Development Program Alternative

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1. Lands with slopes greater than or equal to 5%.
2. Lands with solar insolation levels less than 6.5 kWh/m2/day.

[8] See: Solar DPEIS – Comments – Arizona Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – Colorado Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – New Mexico Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – Nevada Final (TWS and partners 4-18-11)
Solar DPEIS – Comments – Utah Final (TWS and partners 4-18-11)
Solar DPEIS - Comments – California (NRDC and partners)

3. All Areas of Critical Environmental Concern (ACECs), including Desert Wildlife Management Areas (DWMAs) in the California Desert District.
4. All critical habitat areas (designated and proposed) for listed species under the Endangered Species Act of 1973 (as amended).
5. All areas where the applicable land use plan designates no surface occupancy (NSO).
6. All areas where there is an applicable land use plan decision to protect lands with wilderness characteristics.
7. All Special Recreation Management Areas (SRMAs), developed recreational facilities, and special-use permit recreation sites (e.g., ski resorts and camps).
8. All areas where solar energy development proposals are not demonstrated to be consistent with the land use management prescriptions for or where the BLM has made a commitment to take certain actions with respect to sensitive species habitat, including but not limited to sage-grouse core areas, nesting habitat, and winter habitat; Mohave ground squirrel habitat; and flat-tailed horned lizard habitat.
9. All ROW exclusion areas designated in applicable plans.
10. All ROW avoidance areas designated in applicable plans.
11. All areas where the land use plan designates seasonal restrictions.
12. All Desert Tortoise translocation sites identified in applicable land use plans.
13. Big Game Migratory Corridors identified in applicable land use plans.
14. Big Game Winter Ranges identified in applicable land use plans.
15. Research Natural Areas.
16. Lands categorized as Visual Resource Management Class I or II (and, in Utah, Class IIIb).
17. National Recreation Trails and National Back Country Byways.
18. National Historic and Scenic Trails, including a corridor of 0.25 mi (0.4 km) from the centerline of the trail, except where a corridor of a different width has been established.
19. National Historic and Natural Landmarks

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2. Modify the SEZ Alternative to include a process for adding new zones.

To have a meaningful **Modified SEZ Program Alternative**, the BLM must commit not only to a zone-based approach, but also to expanding or adding new zones. The acreage ultimately designated through the PEIS as available for solar development in SEZs is a good starting point, but it is not sufficient, nor optimal, to satisfy changing conditions in the market and natural environment. The BLM's own Reasonably Foreseeable Development scenario makes it clear that the SEZ Alternative has adequate acreage to meet near-term and medium-range needs. Development will not be appropriate for all these lands, however, and changing circumstances will likely require that additional acreage in the form of additional or expanded zones will be needed to provide the agency and industry the flexibility to accommodate changing conditions and to deliver megawatt-hours. To address likely future needs for more acreage as SEZs, we propose the following modifications to the Draft PEIS SEZ Alternative's Solar Energy Program:

a. Modify the Draft PEIS SEZ Alternative to provide for periodic reassessment of the need for new or expanded zones.

BLM should assess the need for additional acreage required to satisfy regional demand for megawatt-hours from large-scale solar development every 5 years on a statewide basis.[9]

Reassessment of the need for additional or expanded SEZs will take place every five years in each of the six states covered by the PEIS. Reassessment can also be triggered at another time by a petition setting out causes, such as changes in policy or reductions in other SEZs. The assessment process should take no longer than six months.

Once a determination of need for additional acreage or megawatts is made, the BLM will commence a public process through an EIS that will be completed within 12-18 months. The BLM will solicit input regarding additional lands to be included from within the approximately 21.5 million acres that the BLM has concluded are potentially suitable for consideration for solar development and which remain eligible after application of exclusion criteria as modified in this PEIS. These future assessments should also take into account adjacent private lands where appropriate. A Draft EIS will analyze potential additions/expansions to address needs, impacts to other resources, and consider a range of alternatives at a level of detail sufficient to permit tiering for NEPA purposes for projects within the new zone(s) as well as consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to the Endangered Species Act. A Final EIS and ROD will then amend the SEZ designations made in the ROD and affected land use plans.

SEZ designation will be subject to specific screening and additional criteria to avoid conflicts and prioritize previously-disturbed lands.

The results of several ongoing processes to identify lands that would be suitable as zones – i.e., the Restoration Energy Design Project in Arizona, the Chocolate Mountains EIS, and the Desert Renewable Energy Conservation Plan in Arizona – should be incorporated as SEZs into the new program in accordance with the criteria set out for new zones below and through the process for adding new zones that we describe herein, without regard to the "triggers" identified for need. In addition, we believe that there are potentially suitable lands for development within the West Mojave and Imperial Valley that BLM should evaluate for new zones.[10] If the BLM issues a scoping notice for potential solar zone(s) within the West Mojave prior to the finalization of the PEIS, the BLM should continue with the examination of those areas for possible RMP amendment after the finalization of the PEIS.

A periodic approach to reevaluation of the need for additional acreage will ensure that SEZs function as they should – as focal areas for appropriate permitting and development, not as ceilings on development. Acreage of public lands is ultimately an input into the commercial production of electricity, and as such an evaluation of additional acreage must be tied to the best available understanding of need, which itself is a function of many factors, including energy use and production patterns across the grid and changes in the availability of specific assets (such as power plants or transmission lines) over time. But acreage of public lands is also a scarce resource managed for multiple uses. The BLM should commit to utility-scale solar development

[9] Appendix 5 includes a fuller discussion of current approaches to determining "need" for additional generation and transmission infrastructure.
[10] See Solar DPEIS - Comments – California (NRDC and partners)

only the lands needed to accomplish the defined purpose, and modify that commitment as conditions change.

The 5-year reassessment should function similarly to the approach taken to ensure the regular reevaluation of transmission congestion mandated by Congress under the Energy Policy Act of 2005 – i.e., through the National Electric Transmission Congestion Study.[11] The commitment to reexamine the circumstances on a rolling basis provides valuable information to decision makers and, importantly, creates an opportunity for the agency to improve its methodology and, as a result, the quality of its output.

The BLM's reasonably foreseeable development scenario provides an important input, but additional information specific to state and regional conditions (including transmission constraints) and changing resource conditions are essential inputs into reassessment. Specifically, the BLM should take into account the criteria provided as Appendix I.

Appendix VII includes criteria for indentifying new zones. These proposed additions should be subject to the list of screening criteria laid out in IM 2011-061, and other screening criteria as appropriate, including those included in Appendix VII to ensure that the additional zones ultimately designated are appropriate for this use. The evaluation process must reflect a priority for identifying lands already degraded by mechanical disturbance as in Arizona's **Restoration Design Energy Project (**RDEP) as well as in the BLM's own screening criteria issued on February 8, 2011. BLM should consider adjacent or intermixed private lands assessing new zones, as is being done in **Arizona's RDEP** and **California's Desert Renewable Energy Conservation Plan (DRECP)**.

b. Modify the Draft PEIS SEZ Alternative to provide for out-of-cycle reassessment triggered by petition.

Acknowledging that significant changes can occur in the interim between required reassessments, the Modified SEZ Program Alternative should also provide for an earlier reassessment triggered by petition. The need for reassessment must be carefully established and linked to significant policy or market changes (e.g., increase in state or national renewable standards or approval of a foundational transmission line), and not, for example, to the desire of an individual developer to construct a particular project on an area of public lands that is not within a zone. An out-of-cycle reassessment should also allow for petition on the basis of seeking changes in already-designated zones, such as elimination or boundary revisions to, for example, take into account identification of special status species or changes in status of species under the Endangered Species Act.

Petitions will be submitted to and decided on by BLM based on national standards for evaluation to be determined in cooperation with the Department of Energy and set out in guidance.

[11] The study, repeated on a three-year cycle, uses key metrics to identify areas experiencing transmission congestion. We have already seen in the repetition of the same findings in the 2006 and 2009 study that three years is likely too close an interval for reassessment. We are not recommending BLM produce a technical study, but rather learn from the experience of conducting a regular reassessment.

c. Modify the Draft PEIS SEZ Alternative to provide for meaningful stakeholder involvement in reassessment.

The BLM's identification of proposed Solar Energy Study Areas laid bare the limitations on in-house data and knowledge at the agency, especially in desert ecoregions. *See, e.g.*, the Scoping Comments of 20 environmental and conservation organizations submitted to the BLM in response to its proposed SESAs on September 14, 2009, and state-specific comments submitted on the Draft PEIS by many of those same organizations. Given the wide range of data needed to ensure a timely and complete decision, the BLM should be responsible for overseeing the reassessment must solicit input regarding need for additional acreage and in identifying and designating additional zones.

BLM should be responsible for making the determination that additional acreage is needed following stakeholder outreach, and notice and comment. Once the decision is made to identify and designate additional acreage for a given state, the BLM in that state will begin the NEPA process. The BLM will solicit input regarding additional lands to be included from within the lands designated as "not excluded from solar development" (currently referred as "available lands") in the PEIS.

Proposed new or expanded zones must be analyzed through an EIS. As noted above, the goal in preparing EISs for new zones should be to produce a document that contains a comprehensive and in-depth look that resources within the proposed zone such that the permitting of projects within the zone can be facilitated by, for example, an environmental assessment . The final EIS and ROD will amend affected RMPs. The reassessment process should also consider changes in conservation status and, as with project-level review proposed under the Draft PEIS Preferred Alternative, remove those lands for which solar energy development is not appropriate from further availability for solar.

For ongoing efforts in California and Arizona, any designation of additional zones should be incorporated, where appropriate, into the **Modified SEZ Program Alternative** outside the reassessment and interim reassessment processes, and RMP amendments processed as part of the ROD developed by those efforts. In the case of California, the DRECP, when completed (and perhaps incrementally prior to completion), will identify lands for conservation and lands for potential solar development. BLM will need to amend the California Desert Conservation Plan as promptly as possible, if not simultaneously, to be consistent with the DRECP's provisions including, for example, its exclusions of all identified conservation lands from solar and other development availability as appropriate, and designating new solar zone(s) based on the potential solar development areas identified in the DRECP.

Again and importantly, SEZ designation should not occur outside the process set out above such as in the regular land use planning process or for individual projects.

Further, additional provisions that should be included in the Modified SEZ Program Alternative are set out and discussed in detail in Section 1.II below.

Recommendations: The Solar PEIS ROD should adopt the Modified SEZ Program Alternative in order to set out a detailed Zone-Based Solar Energy Program, including the text of applicable and revised IMs and other key guidance, as well as additional elements set out above for reassessing zones and criteria for designation, that will be incorporated into all land use plans via RMP amendments as governing solar energy development.

C. ***Pending Applications for Solar Energy Development.***

The Draft PEIS acknowledges that the BLM has continued to receive right-of-way (ROW) applications for solar energy development during the preparation of the PEIS. Further, in the June 30, 2009 Federal Register Notice providing the "Notice of Availability of Solar Energy Study Area maps," the BLM notified applicants that any ROW authorization for a solar energy application filed before issuance of the BLM's ROD for the Solar PEIS would be subject to the requirements adopted in the ROD. The Draft PEIS proposes that ROW applications received after June 30, 2009, but only those within SEZ, would be subject to the ROD. DPEIS, p. 2-5. However, the Draft PEIS does not set out a detailed approach to processing the pending applications, which is also required in order to make the Solar Energy Program effective as soon as possible.

Currently, a great many ROW applications for utility scale solar development have been filed with the BLM. Overall, as of December 23, 2010, approximately 166 ROW applications have been filed.[12] As of April 8, 2011, the BLM had classified 103 of these applications in the six-state study area as "active"[13] and "approved" applications. In all, this "subset" of applications, which included the fast track projects originally identified by BLM as well as lower priority projects, covers 1,038,442 acres and is estimated to have the capacity to produce 60,601 MWs. *See* Table of "Active and Approved Solar Applications on BLM-Administered Lands," prepared by L. Resseguie, December 20, 2010. In California, where there are 30 of these applications, roughly 50 % of them are within proposed zones, including the zones that the State and the environmental community think should be dropped.

It would undoubtedly take significant resources to process all of these applications and it is unlikely that there is enough money to process all of them as well as the transmission that would need to be built to support these projects. (Moreover, many are in inappropriate locations). Although the BLM possesses the legal authority to reject these applications, our groups are not recommending that this be done even after the new solar program is adopted. Rather, as described in more detail below, our groups urge the BLM to adopt a process for dealing with these applications that 1) will ensure that its limited resources are focused on the applications that are most likely to succeed and 2) will not undermine the zone-based approach and its myriad benefits.

Processing pending applications should proceed as follows:

[12] See NRDC, *Bureau of Land Management Utility-Scale Solar Applications – A Geospatial Survey of Active ROW Applications*, April 2011. Data used in production of this report were drawn from BLM.

[13] The meaning of this term is unclear. It may mean that these are "first in line applications." It unquestionably does not mean that the applications have passed the BLM's economic and technical criteria as of that date, let alone the criteria established by Instruction Memorandum 2011-061 on February 8, 2011.

1. Applications filed before June 30, 2009 (the date established by BLM in its Notice of Availability of SESA maps), will be considered, screened, and processed as appropriate with the exception of pending applications within lands excluded from solar energy development.
    a. Pending applications within the acres of public lands excluded from solar energy development under both alternatives presented in the Draft PEIS shall be rejected upon finalization of the ROD.
    b. Applications considered outside of zones will need concurrent RMP amendments as was the case with 'fast track' projects in CDCA.
    c. The prevailing IMs in force as of the finalization of the ROD will be written into the RMPs as the required method for processing all applications submitted prior to June 30, 2009, with the following exceptions:
        i. IM 2011-061 should be amended to reflect the screening criteria agreed to by developers, utilities and other industry representatives, as well as environmental and conservation groups, transmitted to the Secretary on December 22, 2010, and attached as Appendix IX.
        ii. Proximity to National Park Units should remain a high risk factor.
        iii. All pending applications that have not advanced to a Notice of Intent to prepare an EIS shall be subject to the pre-application consultation requirements of IM 2011-061.
    d. BLM shall reserve its right to reject applications at any time and prioritize consideration of pending applications as follows:
        i. Pending applications located within zones, starting with those found to be "low conflict" per the screens established in IM 2011-061, modified as described above, followed by those found to be "medium conflict"
        ii. Pending applications located outside zones found to be "low conflict" per the screens established in IM 2011-061, modified as described above, followed by those found to be "medium conflict"
        iii. Consideration of pending applications is not an assurance that applications will either proceed to environmental review nor be approved
        iv. BLM reserves the right to defer consideration or review of applications on the basis of environmental screening results, as well as on the basis of other appropriate reasons such as agency resource constraints or other agency priorities
    e. Applicants holding pending applications should be assessed an annual "holding fee"
    f. At their discretion, applicants should have the option of withdrawing their applications with a guaranteed refund of application fee.
    g. Applicants should be able to choose to opt into the program established by the PEIS (and set out in the **Modified SEZ Program Alternative**) as follows:
        i. Applicants with pending applications located within designated zones will have the option of electing to be considered under the program established by the PEIS.

ii. Applicants with pending applications located outside of zones that are found to be "low potential for conflict" or "medium potential for conflict" per the screens established in IM 2011-061, modified as described above, will have the option of relocating their project within designated zones on lands not already under application, retaining their filing date seniority, and being considered under the Modified SEZ Program Alternative.

iii. Project proponents with applications pending outside of zones that are found to be "high potential for conflict" per the screens established in IM 2011-061, modified as described above, will not be eligible to opt into the Modified SEZ Program Alternative, and are expected to be screened out under the prevailing agency guidance.

iv. BLM will be expected to enforce requirements from completion of Plans of Development and needed information as has been done in California to work down the list as expeditiously as possible.

v. BLM reserves the right not to process these applications based on available resources and competing priorities.

vi. Zones should be designated as right-of-way corridors pursuant to FLPMA and as such become the immediate priority for consideration.

vii. The 2011-12 priority lists have been established, and will presumptively be worked through not subject to these provisions. However, once designated, zones will be the operational construct for directing agency resources. Accordingly, any pending applications filed prior to June 30, 2009, and not on the 2011-12 priority list would be expected to be considered further only to the extent they are within zones

2. Applications filed after June 30, 2009, will be subject to the Modified SEZ Program Alternative as proposed in this comment letter.
    a. Pending applications within zones will be subject to screening and review pursuant to the PEIS terms.
    b. Pending applications outside of zones will be rejected upon issuance of the ROD.[14]
    c. Future applications will only be accepted within designated zones.
    d. Applications processed under the program established by the PEIS may be subject to competitive offering

Pending Applications must be defined to include only those filed by a certain date in the past. The risk to gaming the system if Pending Applications included applications filed until the ROD, for example, is simply too great. The BLM has already demonstrated it has interest and authority to shield applications in the queue from speculative behavior by mineral developers.[15] And while

[14] At a minimum, pending applications filed post-June 30, 2009, should be deferred until such time as all pre-June 30, 2009, applications are processed and there are no applications pending within zones, provided that the application is subject to a significant holding fee in the meantime.

[15] On April 26, 2011, BLM issued an interim temporary final rule to segregate existing and potential wind and solar lands ROWs, or public lands indentified by the BLM for potential wind and solar generation from competing and potentially conflicting mineral interests. 76 Fed. Reg. 23198. The principle behind the issuance of this rule was sound, in that we agree that such a rule as expressed in the original notice would, "…promote the orderly

a prospective mineral interest can lay harm to the judicious processing of a solar or wind ROW application, the same dynamic is true when multiple and prospective solar ROW applications are accepted, particularly when the boundaries of overlap with preceding applications. Furthermore, the acceptance of multiple ROW applications also threatens to diminish the planning process, given that these multiple ROWs applications compete for the same and limited planning resources of the agency. The same latitude afforded the agency in reducing conflicts through segregation should be applied to establishing a clear boundary date in defining pending applications so that the agency can preclude multiple overlapping applications.

Recommendations: The Solar PEIS needs to address existing applications for rights-of-way in detail and should do so in accordance with the approach set out above and described in further detail below.

D. Conservation of wildlife, habitats and ecosystems concurrent with adoption and implementation of the **Modified SEZ Program Alternative.**

1. The agency should adopt a "no net loss" conservation policy for the **Modified SEZ Program Alternative**

The Preferred Alternative, if adopted without revisions, would undermine at-risk and endangered species, in violation of the Federal Land Policy and Management Act (FLPMA) and applicable BLM policies adopted pursuant to that statute, as well as the Endangered Species Act. The Preferred Alternative would impact more than 400 rare, sensitive, candidate, state-listed and federally-protected plants and animals. For each of these species, BLM identified the acres of potentially suitable habitat in a five million acre area around each zone and then evaluated the potential impact of solar infrastructure on these habitats.

BLM policy pertaining to wildlife, habitats and ecosystems should be consistent with the standards established under BLM's policy on the management of Special Status Species (6840) and Wildlife and Fisheries Management (6500). This standard should require "no net loss" of wildlife as a result of the Solar Energy Program and a "net conservation benefit" to BLM Special Status Species adversely impacted by the program. A net conservation benefit standard would require a project that adversely impacts a listed species to successfully enhance that species' overall population or recovery status. To be classified as a net conservation benefit, the enhancement must benefit the affected species to a greater degree than if the project were not undertaken.

For example, the Special Status Species policy directs the agency to not only minimize threats to sensitive species, but also "improve the condition of the species habitat" and "initiate proactive conservation measures" to minimize the likelihood of ESA listing." BLM Manual 6840.2; 6840.02. Given the breadth and potential of widespread impacts from the new Solar Program, BLM should seize this opportunity to proactively improve conditions for sensitive species across all six states within the PEIS study area. Failing to do so would be inconsistent with BLM

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administration of the public lands by giving the BLM a tool to minimize potential resource conflicts between ROWs for proposed solar and wind energy generation facilities and other uses of the public lands." 76 Fed. Reg. 23199.

wildlife and special status species policy and would pose a great risk to wildlife on BLM lands as solar energy development expands across the landscape. Yet, for more than 100 species, BLM estimated wildlife populations could face up to a 10% loss of their populations or habitat. In the 11,000 page PEIS, however, BLM offered no detailed proposals to offset those losses with beneficial activities elsewhere.

Further, under section 7(a)(1) of the ESA, BLM is explicitly obligated to affirmatively conserve ESA listed species. Because the BLM already requires developers to implement mitigation measures for impacted species, there is already a framework in place for incorporating the no net loss and net conservation benefit standards. These goals are achievable without slowing the development of a growing solar industry or other energy production or other development on BLM land. In fact, we believe that implementation of the no net loss and net conservation benefit goals would increase certainty for developers by clarifying the standard for mitigating project impacts before a project could go forward.

We believe that the appropriate goals for the BLM, given its public trust responsibility as part of a Department with a mission of protecting natural resources and the affirmative Special Status Species policy and ESA obligations are the following:

- BLM should commit, in the ROD, to a goal of leaving regional populations of sensitive wildlife and plant species as well or better off after solar development than before it – 'no net loss.'
- BLM should establish an agency goal for endangered, threatened and candidate plant and animal species that seeks an outcome from each consultation over a proposed SEZ or solar project that will result in a net conservation benefit for all such affected species through mitigation measures including habitat restoration and land acquisition.

These goals can be met by careful planning that allows projects to avoid impacting the most important places for wildlife. With these broad goals in place for sensitive and listed species, remaining impacts on individual species should be offset through compensatory mitigation that creates benefits for wildlife in other appropriate locations. In addition, success in meeting these goals does not have to be achieved solely through developer-funded mitigation and/or as part of the consultation process. Instead, BLM could describe how its own activities to manage and restore species populations would be used in concert with developer efforts and how all those efforts, together, would achieve the no net loss and net conservation benefit standards proposed.[16]

Recommendations: BLM should commit, through the final PEIS, to a goal of leaving regional populations of sensitive wildlife and plant species as well or better off after solar development than before it – 'no net loss.' With regards to endangered, threatened and candidate species, BLM should establish an agency goal that seeks an outcome from each consultation over a proposed solar project that, through mitigation measures including habitat restoration and land

[16] Such an approach is consistent with BLM-directed mitigation of natural gas development-related impacts on mule deer and pronghorn in the Jonah and Pinedale fields in Wyoming. In that case, developers funded a multimillion dollar mitigation fund and intensive monitoring to document and attempt to fully offset impacts on these species. While the monitoring and follow-up actions have not been carried out as envisioned, the approach could be designed and implemented in a manner that would be successful.

acquisition, will result in a net conservation benefit for affected threatened or endangered plants and animal species.

2. The BLM should use agency wildlife policy to assess and develop the Solar Energy Program through a Modified SEZ Program Alternative.

Substantive BLM wildlife policy is established within the Special Status Species Manual (6840) and the Wildlife and Fisheries Management Manual (6500) on BLM lands.[17] The purpose of these policies is to provide guidance to the agency in the conservation of the species, habitat and ecosystems found on BLM lands. The wildlife policies clearly apply to this PEIS and the program it ultimately implements, which the agency has acknowledged is a land use planning process.

BLM wildlife policy can be translated into meaningful program conservation objectives. For example, agency wildlife policy could be used to analyze and develop a solar program which will:

- Conserve or recover ESA-listed species
- Reduce or eliminate threats to BLM sensitive species and minimize the likelihood of listing these species under the ESA
- Ensure self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on the public lands

Given the scale and scope of development being contemplated under a solar program and the significant risk posed to wildlife, habitat and ecosystems by that development, it is imperative that BLM fulfill its wildlife policy obligations with the utmost diligence. Agency policy provides the BLM with measurable conservation objectives that should be incorporated into all aspects of solar energy program planning and implementation, for example as a means of evaluating program and project impacts, and as a standard for implementing key program features, such as mitigation and adaptive management plans.

[17] The objectives of the Special Status Species policy are twofold: 1) To conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA protections are no longer needed for these species; 2) To initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing these species under the ESA. The second objective is of particular use in this case as it provides the agency with the ability to meaningfully characterize the risk posed by solar development to wildlife species.

The Wildlife and Fisheries Management policy provides clear, measurable criteria to the BLM as well: "It is BLM policy to manage habitat with emphasis on ecosystems *to ensure self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on the public lands.*" 6500.06 (emphasis added). In order to accomplish this policy's goal to ensure self-sustaining populations and a natural abundance and diversity of wildlife, section 6500 states that the BLM will, among other things, "ensure *full consideration* of the wildlife, fish, and special status species in land use plans and other BLM activities." 6500.06 (emphasis added)." In addition, it will "ensure that all activity plans (HMPs, AMPs, etc.) include *site specific objectives* for wildlife fish, and special status species and the actions necessary to achieve those objectives."

As with the 6840 policy, the 6500 policy enables BLM to meaningfully assess impacts to fish and wildlife species, and to develop a solar program that is consistent with the agency's policy obligations. In particular, the obligation to ensure self-sustaining populations as well as natural abundance and diversity provide the agency with a meaningful conservation framework. We strongly recommend that the agency apply these wildlife conservation objectives to all aspects of solar program planning and decision-making, for example in the development of meaningful avoidance, minimization and mitigation strategies.

Recommendations: Existing BLM wildlife policy, as set out in the objectives and guidance from BLM's manual for management of Special Status Species (SSS/6840) and Fish and Wildlife (FW/6500) on BLM lands, should be used to identify meaningful conservation objectives as part of the Solar PEIS and the Solar Energy Program. BLM should take this opportunity to set clear goals and commitments to ensure: conservation or recovery of ESA-listed species; reduction or elimination of threats to BLM sensitive species (also minimizing the likelihood of ESA listing for these species under the ESA); and self-sustaining populations and diversity of wildlife, fish, and plant resources on the public lands. In this way, BLM can best comply with its own policies and obligations regarding wildlife management, while also supporting solar energy development.

3. The Solar Energy Program implemented through the Modified SEZ Program Alternative must address groundwater resources.

Water sustainability must be one of the guiding principles for siting solar energy development. Without ensuring water sustainability for power production, the BLM cannot "implement agency-specific programs that would facilitate environmentally responsible utility-scale solar energy development," 73 Fed. Reg. 30908, 30909 (May 29, 2008). The same basins that contain excellent solar resources often have little water to spare for energy development; many are already fully or over-appropriated and many are in a state of overdraft. One research group has found that water availability highly constrains thermoelectric cooling in many of the same areas proposed for solar energy development.[18]

To ensure sustainable water use on BLM lands, the BLM must take all aspects of water resources into account when evaluating solar energy development on our nation's lands. It is critical that BLM ensures that solar energy development limits resource conflict by minimizing water use and reduces energy production's vulnerability to water shortage. We cannot plan for future energy production, energy security and energy reliability without considering how water requirements will be met over time. "[I]t is crucial that the United States develop new policies that integrate energy and water solutions so that one resource does not undermine the use of the other."[19]

For all solar development permitted by BLM, developers must ensure that solar energy water use will not contribute to exceeding the sustainable yield of the surface or groundwater source,[20] to avoid injury to other water rights holders, to federal trust resources, and to special status species. We support the proposed design features required of all solar energy development approved by BLM that prohibit water use that exceeds sustainable yield or affects special status species and sensitive habitats. (A-54, A-57). That said, we recommend BLM include a prohibition on project water use that affects federal trust resources such as national wildlife refuges, national parks, areas of critical environmental concern and similar public lands.

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[18] *See* EPRI, *A Survey of Water Use and Sustainability in the United States with a Focus on Power Generation* (Nov. 2003) (finding high cooling constraints in Clark County, NV; San Bernardino, Riverside, Imperial and San Diego Counties, CA; Doña Ana County, NM; and Alamosa County, CO).

[19] 111 Cong. Rec. S2830 (daily ed. March 5, 2009) (statement of Sen. Bingaman) (noting that "neither resource is routinely considered in developing management policies for the other").

[20] We also suggest a definition for safe or sustainable yield of surface water sources, as one is currently missing from the glossary. "The level of water extraction from a particular system that, if exceeded, would compromise key environmental assets, or ecosystem functions and the productive base of the resource."

In fully appropriated, over-appropriated or overdrafted surface or groundwater basins, BLM and the project developer must ensure that solar energy projects result in no net depletions of water resources or that any depletions are offset. In overdrafted basins, they should also reduce the amount of overdraft. Any increase in depletions constitutes a new appropriation on the system that will reduce and draw down aquifers, adversely affecting vegetation, wetlands, riparian areas, seeps, springs and other wildlife habitats.

The technology exists to conserve our water resources. In basins with little or no available water, it appears that only dry cooled or non-cooled technologies may be feasible. Cooling systems such as dry cooling and hybrid cooling can conserve water in the cooling cycle, and concentrating PV and dish systems can conserve even more water because no cooling cycle is needed. Should cooling technologies become more water efficient or other technologies that operate without a cooling cycle develop, there may be additional opportunity for solar development in the areas with limited water resources. Should non-freshwater sources, such as municipal wastewater, be available, there may be opportunities to utilize water-dependent technologies for cooling or other needs.

BLM has also acknowledged that wet cooling is not feasible within nearly every proposed SEZ.[21] In light of such limited water availability, we expect that the inclusion of design features finding wet cooling infeasible establishes a presumption against BLM approval of projects utilizing wet cooling. Most proposed wet cooled projects will present both significant resource conflicts in their attempts to obtain adequate water rights and also challenges in avoiding unacceptable impacts to water resources and the ecosystems, habitats and species that depend on them.

Recommendations: The ROD should incorporate requirements that limit impacts by basing the selection of solar energy technologies on the available water supply; prohibit unacceptable impacts caused by water use; and mitigate adverse impacts to water and ecological resources.[22] BLM may require a project developer to use non-freshwater sources, such as municipal effluent, or acquire minimization rights that offset adverse and mitigate for impacts to streamflow, aquifer levels, recharge, sensitive fish and wildlife and their habitats, or other impacts, potentially achieving a net gain in water available for ecosystem and habitat needs.

II. Make it legally sufficient

In order to implement the Modified SEZ Program Alternative and effectuate the Solar Energy Development Program described above, the PEIS and its application must comply with applicable legal requirements. As currently drafted, the Draft PEIS is not legally sufficient. The PEIS must be improved to define the scope of environmental analysis conducted and confirm the additional environmental and cultural analysis that is legally required to approve projects.

A. NEPA

[21] This design feature should also apply to any solar energy project outside a given SEZ.

[22] This could be accomplished, by, for example, denying an application if the water requirements of the proposed technology would result in unacceptable impacts.

The National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 *et seq.*, requires, among other things, agencies to conduct environmental analysis of the direct, indirect, and cumulative impacts of proposed actions, as well as mitigation measures, consider a range of reasonable alternatives (including an alternative that minimizes environmental impacts), and solicit and respond to public comments. The Final PEIS should adopt the **Modified SEZ Alternative** described in these comments, which best meets the goals of the PEIS and BLM's Solar Energy Program, and would set out a structure to ensure that BLM's approval of utility-scale solar energy projects comply with NEPA.

1. Scope and adequacy of NEPA analysis for implementing the Modified SEZ Program Alternative.

The Solar PEIS incorporates exclusion of certain lands from utility-scale solar development, assertions about the prioritization of others, and a general preliminary determination of availability for other lands. As discussed above and throughout these comments, and as acknowledged in the Solar PEIS, the environmental analysis contained in the Solar PEIS is not sufficient to approve individual projects, nor is it sufficient to allowing tiering to approve projects using environmental assessments. Additional analysis is required to effectively implement the Solar Energy Program described in these comments, which we have described as the Modified SEZ Program Alternative.

The below analysis discusses both the limitations on the use of the Solar PEIS for approving projects and a path forward for ensuring sufficient and efficient NEPA compliance, by adopting the Modified SEZ Program Alternative. A Solar Energy Program that can be supported and implemented would necessarily incorporate the modifications, clarifications, and additions described in these comments and separate comments addressing the application of the Solar PEIS in each affected state.

(a) The scope of analysis set out in the Solar PEIS generally supports the establishment of the Solar Energy Program incorporated into the Modified SEZ Program Alternative, including designation of Solar Energy Zones.

As noted above, the scope of NEPA analysis in the PEIS must be commensurate with the action that the BLM is undertaking. For the Solar PEIS, the analysis set out can support designation of SEZs and incorporation of program elements such as design features and mitigation measures at the RMP level. However, the environmental analysis set out in the PEIS cannot support substantial tiering such that project-level NEPA could be limited to environmental assessments. Rather, the NEPA analysis conducted in the PEIS sets out a program framework and identifies the next decision points where additional NEPA will be needed – i.e., at a landscape or zone level, and then at a project- or site-specific level. The NEPA analysis in the PEIS must be clearly defined and its limitations recognized in order to support adoption and implementation of the Modified SEZ Program Alternative.

In the context of a programmatic NEPA document, the Supreme Court has held that the environmental consequences of a set of proposed actions must all be considered together in a

single, programmatic EIS when their impacts will have a compounded effect on a region. *See Kleppe v. Sierra Clu*b, 427 U.S. 390, 410 (1976). With respect to solar energy development, BLM is unquestionably establishing a new program, which the Draft PEIS describes as follows:

> The anticipated elements of the BLM's proposed Solar Energy Program include:
> 1. Identification of lands excluded from utility-scale solar energy development in the six-state study area;
> 2. Identification of priority areas within the lands open to solar energy development that are best suited for utility-scale production of solar energy in accordance with the requirements of Secretarial Order 3285A1 (i.e., proposed SEZs);
> 3. Establishment of mitigation requirements for solar energy development on public lands to ensure the most environmentally responsible development and delivery of solar energy; and
> 4. Amendment of BLM land use plans in the six-state study area to adopt those elements of the new Solar Energy Program that pertain to planning.

DPEIS, p. 1-8.

By completing a programmatic EIS, an agency is able to examine "an entire policy initiative rather than performing a piecemeal analysis." *Northcoast Environmental Center v. Glickman*, 136 F.3d 660, 688 (9th Cir. 1998). However, as set out in the NEPA regulations, the analysis is intended to be **pertinent to the policy at issue** and to **occur at relevant points** in the process – and so is not necessarily going to be comprehensive at the first stage. *See*, 40 C.F.R. § 1502.4 (Major Federal actions requiring the preparation of environmental impact statements) ("Agencies shall prepare statements on broad actions so that they are relevant to policy and are timed to coincide with meaningful points in agency planning and decision making"; and can evaluate these actions in the context of "general location," "relevant similarities" of actions, and "stage of technological development.").

The Draft Solar PEIS provides a broad analysis of environmental consequences that will generally support the elements of a solar development program identified in the PEIS, as well as additional proposed modifications incorporated into the **Modified SEZ Program Alternative**, including:

- excluding some lands in the study area from utility-scale solar energy development;
- identifying lands that might be available for solar applications (which will then be refined based on later analysis);
- imposing a set of mitigation requirements (that will also be refined based on location and proposed technology);
- designating zones where solar energy development will be prioritized (although projects will still require further analysis and may not be approved based on conflicts discovered at that level);
- setting out a process for designating additional zones and incorporating them into the PEIS; and
- setting out policies and other procedures that will apply to evaluating, permitting and monitoring solar projects (such as prioritizing use of previously-disturbed lands).

See, generally, DPEIS, Chapter 5.

(b) Additional NEPA analysis is required to effectively implement the Modified SEZ Alternative and to permit tiering for likely environmental consequences and to maximize the efficacy of zones.

The Draft PEIS does not incorporate in-depth analysis of likely environmental consequences to specific resources from utility-scale solar energy development. As noted in Chapter 5, the intent of the analyses presented is "to **describe a broad possible range of impacts** for individual solar facilities, associated transmission facilities, and other off-site infrastructure that might be required to support utility-scale solar energy development." DPEIS, p. 5-1 (emphasis added). Further, the analysis is intended to "**inform the design**" of the BLM's solar energy program. *Ibid*. Neither of these types of analysis would constitute a "hard look" at the direct, indirect, and cumulative impacts to resources and uses of the public lands which could support permitting of projects. As noted above, the scope of NEPA analysis must be commensurate with the action that is proposed; and, as a corollary, the scope of the federal action being analyzed must be accurately characterized to ensure that an EIS of equivalent scope is prepared. *See Aberdeen & Rockfish R. Co. v. SCRAP*, 422 U.S. 289, 322 (1975). The federal action in the Draft PEIS is clearly defined by BLM as a Solar Energy Development Program and the scope of the analysis is of similar breadth and lack of depth, which, consequently circumscribes the use of the analysis to justify activities beyond those that would establish such a program.

The analysis as it pertains to lands outside the proposed SEZs is particularly lacking. The BLM acknowledges in the Solar PEIS that, when considering impacts to special status species, it has only evaluated data in what are termed the "SEZ regions," which are defined as lands within 50 miles of SEZ centers. DPEIS, p. J-2. The agency notes that "an expanded species analysis by alternative was identified too late during the preparation of the Draft PEIS to be accommodated in this version of the document," such that the impacts from the Preferred Alternative to special status species have not been evaluated. *Ibid*. The Draft PEIS further provides that BLM expects "that a discussion of all species with the potential for being impacted under each alternative will be developed between the time of the Draft and Final PEISs." *Ibid*. However, providing the analysis at this later point in the process will not permit the public to review and comment on either the data or the agency's analyses, both of which must be disclosed to the public as part of the Draft PEIS in order to permit the "public scrutiny" that is considered "essential to implementing NEPA." 40 C.F.R. § 1500.1(b). Additionally, the agency has only committed to obtaining additional information regarding special status species and not to other important resources found on the public lands.

Accordingly, use of the Solar PEIS must be limited to supporting a solar energy development program that incorporates the elements described by the BLM and the proposed modifications set out in the Modified SEZ Program Alternative. While the Final PEIS can justify limiting solar energy development to zones, it cannot support project approval without significant additional environmental analysis (as described in further detail below). Similarly, while the PEIS can set out a program governing processing of applications, management of projects, and expanding acreage in zones (also described in further detail elsewhere in these comments), and can incorporate the program into affected RMPs via amendments, the existing analysis cannot

support designation of additional zones in the Final PEIS. To most effectively implement the Modified SEZ Program Alternative and make the most efficient use of designated zones, the PEIS must specifically provide for additional NEPA analysis to be conducted on new zones designated in the future pursuant to the process we recommend in these comments. Such analysis could provide for both the needed landscape- or zone-level analysis and tiering to environmental analysis for individual projects.

i. Tiering

The ability to tier subsequent decisions to the analysis of environmental consequences set out in a programmatic EIS varies based on the definition of the "program" that is analyzed. The NEPA regulations provide:

> Agencies are encouraged to **tier their environmental impact statements to eliminate repetitive discussions of the same issues** and to **focus on the actual issues ripe for decision at each level of environmental review** (Sec.1508.28)…. Tiering may also be appropriate for **different stages of actions**. (Section 1508.28).

40 C.F.R. § 1502.20 (emphasis added).

Thus, while tiering of environmental analysis is encouraged, it is necessarily limited to the issues analyzed at the programmatic level; and each level or stage of analysis should focus on the actual issues that are "ripe" for decision – meaning that there is sufficient information to conduct a meaningful analysis.

The discussion of these issues in CEQ's "NEPA's Forty Most Asked Questions" (http://ceq.hss.doe.gov/nepa/regs/40/20-29.HTM#24) is also instructive:

> 24b. When is an **area-wide or overview EIS** appropriate?
> A. The preparation of an area-wide or overview EIS may be particularly useful when similar actions, viewed with other reasonably foreseeable or proposed agency actions, share common timing or geography. For example, when a variety of energy projects may be located in a single watershed, or when a series of new energy technologies may be developed through federal funding, the overview or area-wide **EIS would serve as a valuable and necessary analysis of the affected environment and the potential cumulative impacts of the reasonably foreseeable actions under that program** or within that geographical area.
>
> 24c. What is the function of **tiering** in such cases?
> A. Tiering is a procedure which allows an agency to avoid duplication of paperwork through the **incorporation by reference of the general discussions and relevant specific discussions** from an environmental impact statement of broader scope into one of lesser scope or vice versa. In the example given in Question 24b, this would mean that an **overview EIS would be prepared for all of the energy activities reasonably foreseeable in a particular geographic area or resulting from a particular development program**. This impact statement would be **followed by site-specific or project-specific EISs. The tiering process would make each EIS of greater use and**

> **meaning** to the public as the plan or program develops, without duplication of the analysis prepared for the previous impact statement.

(emphasis added). Thus, where a programmatic EIS does not contain "specific discussions" of environmental impacts, there is no such environmental analysis to which subsequent NEPA documents can tier, and those discussions will need to be completed at the next level.

Because (and provided that) the Solar PEIS does not seek to approve individual projects or take the place of site-specific analysis, the scope of its NEPA analysis can be focused more on the general types of impacts and the overall effect of this policy initiative, as is most common for a programmatic EIS. *See*, *Northcoast Envt'l Center v. Glickman*, 136 at 688 (Programmatic EIS is used to examine "an entire policy initiative."). However, in order for the BLM to commit to a specific course of action, such as authorizing actual projects, a site-specific and use-specific analysis must be completed. *See*, *State of California v. Block*, 690 F.2d 753, 765 (9th Cir. 1982); *County of Suffolk v. Secretary of Interior*, 562 F.2d 1368, 1378 (2nd Cir. 1977). The NEPA analysis required to effectuate the Solar PEIS is discussed in further detail below.

ii. Subsequent NEPA analysis is required

To follow the path set out by the structure of the Solar PEIS and implement the **Modified SEZ Program Alternative**, BLM should evaluate the impacts of utility-scale solar development at both a regional or landscape level (i.e., SEZs) and at the project level. Landscape level analysis should meaningfully address, among other things, cumulative impacts (currently lacking in the Draft PEIS), to which site-specific, project analysis can be tiered. In this manner, development of utility-scale solar energy projects on the public lands can be informed by knowledge of affected resources and reviews can be conducted efficiently.

1) Analysis of potential impacts at a landscape/zone level.

In the context of the Solar Energy Zones that would be designated in the Solar PEIS, the BLM should next look to the effect on the landscape within the zones. A landscape level analysis of potential utility-scale solar energy development within a watershed, region, zone, portion of zone, or (where zones are smaller) across a number of zones, should take into account the distribution of resources in the landscape, complying with the BLM's legal obligations to assess potential impacts. Large solar developments can disrupt landscape connectivity and impede ecological processes occurring at the landscape-scale such as water flow and availability, wildlife migration, species composition, disturbance, and ecosystem response to climate change.

In considering the potential impacts of permitting development across an entire zone or large area, the BLM must consider how utility-scale solar will change the landscape and interfere with species' ability to migrate and survive. The landscape level analysis must further demonstrate that development is compatible with agency wildlife policy (population level impacts, etc). In the context of this analysis, BLM can then make informed decisions regarding how to manage development in a geographic context that is narrower than the entire PEIS study area but broad enough to permit evaluation of cumulative impacts.

This type of landscape approach is supported by NEPA guidance on cumulative impacts, which requires that the entire area potentially affected be included in a cumulative analysis and holds that a failure to include an analysis of actions within a larger region will render NEPA analysis insufficient. *See, e.g., Kern v. U.S. Bureau of Land Management*, 284 F.3d 1062, 1078 (9th Cir. 2002) (analysis of root fungus on cedar timber sales was necessary for entire area). Thus, in order to accurately evaluate the potential environmental consequences of solar energy development in a zone or comparable area, the cumulative impact analysis would necessarily look at the cumulative impacts on all of the directly and indirectly affected landscapes. The Environmental Protection Agency, in providing direction to its reviewers, emphasizes the importance of ensuring that the cumulative impact analysis is based on "geographic and time boundaries large enough to include all potentially significant effects on the resources of concern. The NEPA document should delineate appropriate geographic areas including natural ecological boundaries, whenever possible, and should evaluate the time period of the project's effects." U.S. Environmental Protection Agency, 1999, *Consideration Of Cumulative Impacts In EPA Review of NEPA Documents*. (emphasis original).

We encourage analysis to be based on watershed boundaries or relevant ecological boundaries, capitalizing on existing regional ecosystem assessments, state fish and wildlife agency analyses, or equivalent analyses by conservation organizations such as The Nature Conservancy. Analysis conducted in this way can be informed by existing databases and should reduce the need for duplicative baseline ecosystem analyses. Analysis at the watershed or ecosystem level should also facilitate required cumulative impacts assessments and the development of mitigation plans for project-specific impacts.

The Council for Environmental Quality's (CEQ) guidelines on cumulative effects analysis provide the following steps for determining the appropriate geographic boundary of cumulative impact analysis:

1. Determine the geographic area that will potentially be directly affected by an action – known as the "project impact zone";
2. Identify resources in the project impact zone that could be affected by the action;
3. Determine the geographic areas occupied by the resources outside the project impact zone.
4. Identify the appropriate area for analysis of cumulative effects based on the largest of the areas determined in step 3.

Council on Environmental Quality, 1997, *Considering Cumulative Effects Under the National Environmental Policy Act*.

When conducting environmental analysis of a zone, the geographic area of impact will include the resources, such as wildlife, within areas of proposed development and their habitat extending outside such areas. The agency can then complete a baseline assessment of affected resources (40 C.F.R. § 1502.15) and effectively take into account the overall impacts of development in a zone on the broader affected areas and resources when considering their potential environmental consequences. *See, e.g., Newmont Mining Corp*., 151 IBLA 190 (1999) (Where the BLM could take into account the overall degradation from existing and connected proposed operations, a cumulative analysis of all impacts was required); *Kern v. United States Bureau of Land*

Management, supra. (Cumulative impact analysis of reasonably foreseeable future timber sales on spread of root fungus required before approving single proposed sale).

While the PEIS generally supports creation and implementation of a solar energy development program consistent with the **Modified Solar Energy Zone Program Alternative**, a next step of environmental impact analysis is needed to look at cumulative impacts at a reasonable scale. Analyzing an individual project will not provide the needed context for evaluating development in a designated SEZ. As discussed above, there are numerous resources that will be affected by designation of SEZs and these impacts must be evaluated in a sufficient context. Further, NEPA requires that the BLM "integrate the NEPA process with other planning at the earliest possible time to insure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts." 40 C.F.R. § 1501.2. Moreover, this analysis will address previous deficiencies present in cumulative impact analyses in project specific-EISs.

In order to effectively use the SEZ designations, BLM must conduct further analysis at the landscape level. NEPA does not permit the BLM to defer such analysis to a specific project. In addition, the environmental analysis generated at this level will not only provide a basis for developing a needed baseline and for additional analysis of direct, indirect and cumulative impacts, but will also provide a usable set of analyses to which evaluation of the environmental consequences of subsequent projects can be meaningfully tiered and for which appropriate, effective mitigation measures can be developed.

As acknowledged in the Draft Solar PEIS, the agency has not thoroughly evaluated resources within the SEZs and has performed an even lesser evaluation on the 22 million acres of lands outside the SEZs identified as available for solar development. Analysis at a landscape level should take into account the distribution of resources across the area and the effects on resources outside the area. Ongoing efforts such as the BLM's Rapid Ecoregional Assessments and the California Desert Renewable Energy Conservation Plan, are compiling vital baseline information that should be incorporated into ongoing analysis under the Solar PEIS.

A more in-depth discussion with a recommended approach for conducting landscape-level analysis to special status species is attached as Appendix V and incorporated herein by reference.

The analysis described in this section is a major federal action and should be completed through an EIS. *See*, 40 C.F.R. § 1501.4. We would also note that in the example from CEQ's recommendations quoted above, a series of EISs is specifically contemplated – which is required in this instance to conduct sufficient analysis of affected resources.

2) <u>Analysis of environmental impacts of specific projects</u>.

BLM's resource management plans and project-level EISs often state that site-specific analysis is not possible until a particular activity, such as a pipeline, is proposed. Preparation of a landscape level EIS on zones, during the designation process, would also be consistent with the NEPA regulation governing tiering environmental analysis for a site-specific action to a broader programmatic EIS or series of EISs. The regulation envisions that agencies can tier to a "broad environmental impact statement" so that the subsequent environmental document "shall

concentrate on the issues specific to the subsequent action." 40 C.F.R. § 1502.20. In the context of the zone or landscape-level EIS, the broader document would analyze the effects of likely utility-scale solar development. While the analysis of a zone can evaluate the impacts on resources present in that area based on a baseline inventory, refined RFD, and expected technologies, further evaluation will be required for each project based on the actual location, technology, and plan of development. These analyses can tier to the PEIS and the subsequent landscape-level EIS, but will still need to address substantial issues and should provide for public comment and engagement throughout the process as well. (A recommended NEPA process for proposed projects is discussed in more detail later in these comments.) The goal of this final stage of environmental analysis should be that it can be completed through an environmental assessment, based on adequate comprehensive analyses conducted previously. By conducting sufficient analyses at the scale of the SEZ, BLM will ensure that adequate baseline data exist to streamline environmental review at the project level, reducing the need for intensive analysis at a level and unlocking the potential of zones and guided development.

In addition, analysis of specific projects could be conducted as part of the landscape-level EIS described in the preceding section. As an example, the Programmatic EIS for Geothermal Leasing and Development evaluated a number of pending lease applications for approval while incorporating by reference the programmatic NEPA analysis conducted to evaluate the broader landscape effects. A similar approach could be taken here, where the site-specific analysis for individual projects could be presented and also take into account the landscape-level analysis conducted for specific zones or areas, so that the EIS would provide both approval for an individual project or set of projects and NEPA analysis to support future projects.

Recommendations: The NEPA analysis set out in the Draft Solar PEIS cannot support approval of projects using environmental assessments and does not provide sufficient landscape-level analysis of specific resources and impacts from utility-scale solar energy development. While this may be acceptable in a PEIS, it is only acceptable if the Solar PEIS ROD acknowledges the limitations of the NEPA analysis contained in the PEIS for purposes of tiering and approving projects, and commits to conduct the necessary landscape-level and project-specific analysis, as discussed above. By preparing detailed EISs as part of designating future SEZs, the BLM can provide sufficient environmental analysis to support substantial tiering for analysis of projects proposed within those zones.

2. The PEIS must consider a reasonable range of alternatives, including the Modified SEZ Program Alternative.

The range of alternatives is "the heart of the environmental impact statement." 40 C.F.R. § 1502.14. NEPA requires BLM to "rigorously explore and objectively evaluate" a range of alternatives to proposed federal actions. *See* 40 C.F.R. §§ 1502.14(a), 1508.25(c). "An agency must look at every reasonable alternative, with the range dictated by the nature and scope of the proposed action." *Nw. Envt'l Defense Center v. Bonneville Power Admin.*, 117 F.3d 1520, 1538 (9th Cir. 1997). An agency violates NEPA by failing to "rigorously explore and objectively evaluate all reasonable alternatives" to the proposed action. *City of Tenakee Springs v. Clough*, 915 F.2d 1308, 1310 (9th Cir. 1990) (quoting 40 C.F.R. § 1502.14).

NEPA requires that an actual "range" of alternatives is considered, such that the Act will "preclude agencies from defining the objectives of their actions in terms so unreasonably narrow that they can be accomplished by only one alternative (i.e. the applicant's proposed project)." *Col. Envtl. Coal. v. Dombeck*, 185 F.3d 1162, 1174 (10th Cir. 1999), citing *Simmons v. U.S. Corps of Engineers*, 120 F.3d 664, 669 (7th Cir. 1997). This requirement prevents the environmental impact statement (EIS) from becoming "a foreordained formality." *City of New York v. Dep't of Transp.*, 715 F.2d 732, 743 (2nd Cir. 1983). *See also Davis v. Mineta*, 302 F.3d 1104 (10th Cir. 2002).

The Draft PEIS only evaluates two action alternatives and dismisses all other alternatives without thorough consideration. A reasonable range of alternatives should evaluate specific approaches to limiting development to SEZs, prioritizing development in SEZs, prioritizing use of previously disturbed lands, and expanding or designating new SEZs. Defining the action alternatives as only SEZs comprising less than 700,000 acres *or* a program encompassing close to 22 million acres available for development is not reasonable. Given the range of acreage available for utility-scale solar energy development in the alternatives evaluated in the Draft PEIS, the BLM can feasibly evaluate more detailed alternatives for available acreage and guiding development, including the Modified SEZ Program Alternative set out in these comments.

The PEIS's deficient treatment of alternatives does not appear to stem from the purpose and need statement that it includes. While the BLM has had difficulty articulating a sufficiently broad purpose and need statement in its EISs on specific projects, the purpose and need statement included here – which NEPA requires – seems quite adequate. In this case, however, the PEIS does not support BLM's selection of its Preferred Alternative.

In the Draft PEIS, BLM states that the purpose and need of its program is to guide solar energy developers to areas with the fewest resource conflicts and potential controversy, and to "identify and prioritize development in locations best-suited for such development, called solar energy zones." DPEIS, pp. ES 2- ES 3. The stated purpose of the proposed action is to enable BLM to "prioritize solar energy and associated transmission infrastructure development" in the Solar Energy Zones. The Preferred Alternative, however, merely encourages development in the identified SEZs, and, accordingly, on its face does not achieve these stated purposes and goals as well as the SEZ Alternative, let alone better. Moreover, the PEIS contains no explanation as to why the BLM believes that the Preferred Alternative would achieve these purposes better than the SEZ Alternative.

As we demonstrate throughout these comments, the SEZ Program Alternative, which would require development to be located in the designated zones, would meet the solar development goals in the RFDS, even after dropping some zones and reducing others in size as we have proposed. BLM's primary justification for selecting the Preferred Alternative, that it would likely result in the highest pace of development at the lowest cost, is unsupported by any analysis. Our organizations are certain, based on our cumulative experience with various BLM programs, including BLM's oil and gas program under the Bush Administration which the BLM's Preferred Alternative closely resembles, that the result of selecting the preferred alternative will be controversy, delay and increased costs.

Recommendations: Given the breadth of acreage at issue and the elements of a Solar Energy Program that require further assessment and description, the Solar PEIS should examine additional alternatives in detail, including the Modified SEZ Program Alternative described in these comments. The Modified SEZ Program Alternative best meets the goals of the PEIS and BLM's Solar Energy Program and should be adopted in the Final PEIS and ROD.

3. BLM must consider impacts to environmental resources.

NEPA dictates that BLM take a "hard look" at the environmental consequences of a proposed action. The requisite environmental analysis performed by an agency "must be appropriate to the action in question." *Metcalf v. Daley*, 214 F.3d 1135, 1151 (9th Cir. 2000); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989). In order to take the "hard look" required by NEPA, BLM is required to assess impacts and effects that include: "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, *whether direct, indirect, or cumulative*." 40 C.F.R. § 1508.8. (emphasis added). The Draft PEIS does not sufficiently evaluate impacts from the alternatives, impacts from the implementation actions it contemplates, or the effects on certain resources, as discussed below.

As a starting point, any analysis of environmental effects must build off of the climate change-affected baseline described in the affected environment. Climate change may influence (e.g., exacerbate or ameliorate) a proposed action's impact on the environment and may pose risks to the proposed action or planning area. As such, among the effects BLM must now consider are effects of the proposed action on the vulnerability of the affected environmental resources to climate change and the ability of these resources to adapt to climate change. *See* 40 C.F.R. § 1508.8 (defining 'effects' to include ecological effects, "such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems"). Without climate change trends and projections built into the affected environment, the environmental effects analysis lacks consideration of climate change.

a. Use of previously-disturbed lands.

Both action alternatives in the Draft PEIS incorporate the design features contained in Appendix A. In order to avoid impacts to ecological resources, the first design feature set forth in Draft PEIS Section A.2.2.11.1 states that "[t]o the extent practicable, projects shall be sited on previously disturbed lands in close proximity to energy load centers to avoid and minimize impacts on remote, undisturbed lands." Additionally, Section 5.10.1.1 of the PEIS recognizes that the "fragmentation of large, undisturbed habitats of high quality by facility or ROW construction would be considered a greater impact than construction through previously disturbed or fragmented habitat." DPEIS, p.5-66. The BLM cites the potential of the Preferred Alternative to locate projects on previously disturbed lands as an important factor justifying its selection. DPEIS, p. 6-35

BLM does not evaluate the availability, quantity, and location of previously disturbed lands to support its conclusion that the Solar Energy Development Program Alternative "potentially would allow a greater degree of development on previously disturbed lands" than the Solar Energy Zone Program Alternative. PEIS at 6-49. BLM's conclusion that the preferred alternative will facilitate development on such lands is purely speculative. *See Sierra Club v.*

United States Forest Serv., 843 F.2d 1190, 1195 (9th Cir. 1988) (observing that "[t]he purpose of an EIS is to obviate the need for . . . speculation by insuring that available data are gathered and analyzed prior to the implementation of the proposed action.") This failure precludes a meaningful comparison between the action alternatives; the agency simply does not know if previously disturbed lands are available for solar development, how many acres are available, or where such lands are located.

The final PEIS should further evaluate the quantity, availability, and location of previously disturbed lands: (1) as a unique reasonable alternative that the agency should consider, and/or (2) as SEZ selection criteria. The evaluation of information on previously-disturbed lands will allow for a more meaningful choice between alternatives and bolster confidence that the primary design feature for the protection of wildlife and ecological resources set forth in Appendix A – that "projects shall be sited on previously disturbed lands . . . to avoid and minimize impacts on remote, undisturbed lands" – will have a significant practical application.

b. Criteria for designation of SEZs.

As part of analyzing consequences to the environment, BLM's "hard look" must be based on adequate data and analysis. NEPA's hard look at environmental consequences must be based on "accurate scientific information" of "high quality." 40 C.F.R. § 1500.1(b). Essentially, NEPA "ensures that the agency, in reaching its decision, will have available and will carefully consider detailed information concerning significant environmental impacts." *Robertson v. Methow Valley Citizens Council*, 490 U.S. at 349.

BLM does not evaluate its SEZ selection criteria in the PEIS. The principal programmatic feature of the PEIS's two action alternative is identical: BLM will identify lands where potential conflicts are minimal and establish SEZs. NEPA implementing regulations require that BLM "insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements." 40 C.F.R. § 1502.24. BLM selected the twenty-four SEZs presented in the PEIS based on (i) proximity to existing or designated transmission corridors, (ii) proximity to existing roads, (iii) slopes of 1-2% or less, (iv) a minimum size of 2500 acres, and (v) "additional filters based on local conditions, institutional knowledge, and coordination efforts." PEIS at ES-7. However, the Draft PEIS does not contain a discussion of whether these selection criteria actually result in the selection of lands most suitable for solar development. BLM did not evaluate additional or alternative selection criteria, nor did it offer more than a vague description of what the selection criteria actually were. For example, the PEIS does not contain information on how close to transmission and roads public lands must be to be included in a SEZ or the scope of the "additional filters."

The state chapters do not provide any additional certainty about the programmatic selection criteria. For example, the Arizona appendix states that for the Brenda SEZ: "The criteria used to identify the SEZ as an appropriate location for solar energy development included proximity to existing transmission or designated corridors, proximity to existing roads, and a slope of generally less than 2%. In addition, the area was identified as being *relatively free* of other types of conflicts, such as FWS-designated critical habitat for threatened and endangered species, Areas of Critical Environmental Concern (ACECs), Special Recreation Management, Area (SRMAs), and National Landscape Conservation System (NLCS) lands (see Section 2.2.2.2 for

the complete list of exclusions). PEIS at 8.1-1 – 8.1-2, BLM does not offer information in the PEIS as to what "relatively free" means in terms that can be applied to new SEZs.

As a result, the PEIS fails to establish a robust, clearly defined programmatic selection program for SEZs, and the methodology for establishing the SEZs, the critical feature under both of the alternatives presented in the Draft PEIS, escapes review. In order to provide a scientific basis for the SEZs, BLM should incorporate spatially explicit wildlife data and previously-disturbed lands data into the PEIS. BLM should also provide an analysis of its zone selection criteria, including an analysis of alternatives to the model presented in the PEIS, that provides the agency and the public a meaningful opportunity to understand the critical feature of BLM's proposed solar development program. To further address this deficiency, expansion, modification or designation of new SEZs should be subject to the criteria set out below.

c. Lands with Wilderness Characteristics.

The scoping notice for the Solar PEIS, highlighted lands with wilderness characteristics, stating:

> The BLM has the authority to develop protective management prescriptions for lands with wilderness characteristics within RMPs. As part of the public involvement process for land use planning, the BLM will consider public input regarding lands to be managed to maintain wilderness characteristics.

73 Fed.Reg. 30911 (May 29, 2008).

The lands encompassed by both the SEZs and the additional lands identified as available for solar energy development contain extensive lands with wilderness characteristics, including those identified in citizen inventories, which were previously submitted to the BLM during the scoping process for this PEIS.

Wilderness character is a resource for which BLM must keep a current inventory. As the U.S. Court of Appeals for the Ninth Circuit held:

> wilderness characteristics are among the 'resource and other values' of the public lands to be inventoried under § 1711. BLM's land use plans, which provide for the management of these resources and values, are, again, to "rely, to the extent it is available, on the inventory of the public lands, their resources, and other values." 43 U.S.C. § 1712(c)(4).

Oregon Natural Desert Ass'n v. Bureau of Land Management, 531 F.3d 1114, 1119 (9th Cir. 2008). Accordingly, in preparing the Solar PEIS, BLM must not only identify the wilderness resource, but also evaluate the potential impacts of solar energy development in the various alternatives on wilderness characteristics.

Before permitting any type of surface-disturbing activity on lands with wilderness characteristics, the BLM must evaluate the degree to which wilderness characteristics may be affected by the proposed activity. Specifically, prior to permitting these activities, in the appropriate implementation-level NEPA documents, the BLM should:

- analyze the direct, indirect and cumulative impacts of the proposed activity on potentially affected lands with wilderness characteristics;
- analyze the potential benefits of protecting lands with wilderness characteristics from the proposed surface-disturbing activity; and
- where the BLM has determined not to manage an area to protect its wilderness characteristics, and where BLM has determined that the proposed surface-disturbing activity should move forward, it should evaluate methods that can be incorporated into project approvals to mitigate the projects' impacts to the lands' wilderness characteristics; and adopt appropriate mitigation where warranted.

Secretarial Order 3310, issued by Secretary of the Interior Salazar on December 23, 2010, affirms that protection of wilderness characteristics is a "high priority" for the public lands and that the BLM should protect the "open and natural productive state" of these lands. The Order requires the agency to identify wilderness characteristics and to formally protect those characteristics where they are found. The Order further directs the agency to not only inventory for wilderness characteristics, but also to formally designate lands where those values are identified as "Lands with Wilderness Characteristics." The BLM must identify Lands with Wilderness Characteristics in the Solar PEIS ROD.

Further, in this PEIS, the BLM should also designate Wild Lands. Secretarial Order 3310 directs the BLM to "ensure that any new project-level decision or land use planning effort takes wilderness characteristics into consideration." The BLM is also required to protect its ability to designate Wild Lands by identifying and protecting Lands with Wilderness Characteristics as other projects and interim management decisions arise, which would also encompass the Solar PEIS and individual projects that might seek approval. Accordingly, identifying Lands with Wilderness Characteristics and designating Wild Lands would provide the most comprehensive guidance for further development. The Solar PEIS ROD should provide that solar energy development is excluded on both Lands with Wilderness Characteristics and designated Wild Lands, including in designation of new SEZs.

d. Visual Resources.

The Federal Land Policy and Management Act of 1976 (FLPMA) identifies "scenic values" as one of the resources for which public land should be inventoried and managed, and directs that "the public lands be managed in a manner that will protect the quality of ...scenic...values. 43 U.S.C. §§ 1702(c), 1701(a)(8). Utility-scale solar energy development can impact these resources.

The Draft PEIS acknowledges the potential impact to visual resources by incorporating special management of areas adjacent to certain National Parks. In discussing areas to be excluded from development, the Draft PEIS states: "In Utah, Visual Resource Management (VRM) Class III lands have also been removed due to the high sensitivity and location proximity to Zion, Bryce, Capital Reef, Arches, and Canyonlands National Parks, and to significant cultural resource special management areas (in southeast Utah)." DPEIS, p. ES-9.

Guidance issued by the BLM since the PEIS went to press further underscores the BLM's obligation to take scenic values and potential impacts to those values into account. Instruction

Memorandum (IM) 2011-061, issued on February 8, 2011, affirms the BLM's goal of "direct[ing] development away from lands with high conflict or sensitive resource values," acknowledges the "[h]igh potential for [c]onflict" with development on "*lands near or adjacent to*" such "sensitive viewsheds, resources and values" as units of the National Park System, refuges, national forests and lands in the NLCS as well as lands adjacent to designated and eligible wild, scenic and recreational rivers and lands currently designated as VRM Class I or II by BLM. IM 2011-061, (Solar and Wind Energy Applications – Pre-Application and Screening), pp. 4, 5

In the West-wide Energy Corridor PEIS prepared by BLM, Appendix S identifies and evaluates both direct conflicts with potentially sensitive visual resource areas such as national conservation areas, monuments, scenic/historic trails, and also "proximity events" where a corridor passes within 5 miles of the boundary of a potentially sensitive visual resource area.[23] As shown in Appendix S to the West-wide Energy Corridor PEIS, changes to proposed corridor designations were made based on some of these visual resource impacts.

Similarly, in the Solar PEIS and subsequent analyses of SEZs and individual projects, impacts to visual resources should be evaluated and should be considered in defining locations and boundaries for both SEZs and projects. In addition, as the BLM is continuing to conduct visual resource inventories as part of plan amendments, the updated data on visual resources on the public lands should be incorporated into the PEIS and ongoing analysis for SEZs and projects.

e. Water resources.

A programmatic EIS "must provide sufficient detail to foster informed decision-making." *Citizens for Better Forestry v. U.S. Dep't of Agric.*, 481 F.Supp.2d 1059, 1086 (N.D. Cal. 2007) (internal quotations omitted). Although programmatic and reliant on future site-specific analyses, the EIS must still provide a "reasonably thorough discussion of the significant aspects of the probable environmental consequences." *Northern Alaska Envt'l Ctr. v. Lujan*, 961 F.2d 886, 890 (9th Cir. 1992) (internal quotations omitted).

BLM has not provided a reasonably thorough discussion on the context or intensity of the impacts to water resources. *See generally* 40 C.F.R. § 1508.27 (listing considerations that inform significant effect). For example, the DPEIS cannot assess whether water use or other effects on water resources would comply with state or local laws or policies. DPEIS, p. 5-38 (myriad of applicable laws is complex and requires case-by-case analysis).

Water use requirements – an important consideration for impacts to soils, vegetation, aquatic fish and wildlife and air quality – could be obtained from surface water, groundwater or recycled water, DPEIS 5-37, or water could be trucked in from off-site, DPEIS 5-39. The DPEIS, however, does not quantify the water use requirements for the preferred alternative regardless of the source or, therefore, the resultant direct, indirect or cumulative impacts of water use on such a grand scale. The DPEIS is also unclear as to the likely source of groundwater for construction or operations. *Compare* DPEIS 5-100 ("the use of groundwater for construction activities is

[23] Available at: http://corridoreis.anl.gov/documents/fpeis/vol2/WWEC_FPEIS_App_S.pdf .

unlikely"), DPEIS 5-39 ("In most areas, groundwater would likely be withdrawn from local aquifers to meet the project's water needs.").

The Draft PEIS also declines to estimate the water use demands – and subsequent effects – of the SEZ alternative. Not only does the DPEIS fail to identify these impacts for the SEZ alternative as a whole, but also for individual SEZs. *See, e.g,* DPEIS 11.2-185 ("[i]mpacts of groundwater depletion from solar energy development in the Delamar Valley SEZ cannot be quantified without identification of the cumulative amount of groundwater withdrawals needed to support development on the SEZ"); DPEIS 11.1-194 (same, Amargosa SEZ). In each case, BLM has this information, having estimated low and high water demands for construction and operation within the SEZ and being capable of estimating water demands of nearby projects – BLM simply needed to incorporate this information into a regional groundwater model that could project the impacts of groundwater pumping on species habitats but failed to do so. BLM cannot postpone this analysis to the project-specific level.[24]

The Draft PEIS similarly makes no attempt to quantify the acreage that would be affected by the solar energy development program, and thus the amount or length of streams and washes potentially destroyed and degraded by solar development. It follows that there is no analysis of the extent of water quality impacts from channelization, erosion, sedimentation due to alterations in surface drainage patterns. The DPEIS acknowledges the potential for water quality impacts due to soil erosion, sedimentation, spills, wastewater treatment and storage, pesticide and herbicide application and dust suppressants, but provides no indication as to the severity of the impacts, for example, by discussing potential impacts to public health, to water quality standards, or to special status species. The DPEIS also provides little information regarding the environmental impacts of water and wastewater treatment.

The central considerations regarding groundwater resources to developing a responsible solar energy program are discussed above. We offer the following comments regarding water use assumptions as described in Chapter 3 and Appendix F.

Fire Protection. Parabolic trough plants use highly flammable heat transfer fluids in their heat-collecting elements. Use of these fluids in heat-collecting elements and/or for heat storage is a fire hazard. Arnold Leitner, *Fuel from the Sky, Solar Power's Potential for Western Energy Supply* 85 (National Renewable Energy Laboratory, 2002), available at http://www.nrel.gov/csp/pdfs/32160.pdf. Solar energy projects utilizing other technologies for heat collecting that have been reviewed by BLM have included fire protection among their water needs. Examples of these include the Imperial Valley Solar Project, the Amargosa Farm Road Project and the Solar Millenium Blythe Project.[25] Given the above, BLM's review of water use should assess the need for and availability of water for fire suppression as well as the likelihood and effects of fire in an arid, desert ecosystem.

[24] Failure to model these impacts renders BLM's conclusion that "[t]he implementation of programmatic design features and complete avoidance or limitations of groundwater withdrawals from the regional groundwater system would reduce impacts on the groundwater-dependent species to small or negligible levels" unsupportable. DPEIS 11.2-185.

[25] These projects also used water for soil compaction needs, another potential water requirement not discussed in these overview sections.

Water Treatment. Water used in steam cycles requires treatment to control total dissolved solids (TDS) and prevent scale formation. Water used in the cooling cycle also requires treatment to prevent algae formation and scaling, while water used for mirror washing may also require treatment to reduce TDS concentrations, and water for potable uses may also require treatment. Additional water treatment needs occur at the back end, for treatment of sanitary wastewater and blowdown wastewater (if applicable).

The DPEIS provides little information that details the methods for water treatment, the criteria that dictate the choice of treatment method, the chemicals that may be stored or used on-site, and how any waste stream would be disposed of. Considerations regarding the need for and level of water treatment can inform the tradeoffs between using higher quality water that can increase the cycles of concentration and reduce the quantity of makeup water or utilizing less water treatment.

The DPEIS also provides little information regarding wastewater treatment except to say that three methods – evaporation ponds, septic tanks, off-site treatment – may be employed at any time. The PEIS should disclose this information, including the contaminants in the waste streams, treatment and disposal methods, chemicals that may be stored/used, the water and wildlife impacts of evaporation ponds and the impacts of increased vehicle traffic if treated off-site.

f. State-specific resources.

In the separate comments addressing each of the six states and each SEZ, we have identified additional resources and impacts of concern that should be specifically evaluated and also addressed in the policies, mitigation measures, and design features that will be finalized in the ROD. These include, but are not limited to, water resources, water quality, impacts to groundwater-dependent species and their habitats, soil erosion and associated vegetation impacts; soil diseases and toxins; habitat connectivity, wildlife movement corridors and fencing; playa wetlands; desert tortoise relocation; and transmission, roads and other associated infrastructure.

g. Aquatic Biota

The DPEIS should provide greater context to highlight the scarcity of and stress to water resources in the planning area. Both the main volume and state-specific volumes contain extremely little information about the existing flow systems, their status and the importance. In the six-state area, intermittent and ephemeral streams make up "over 81% [of all streams] in the arid and semi-arid Southwest (Arizona, New Mexico, Nevada, Utah, Colorado and California)." Levick, L. et al., *The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest* iii (EPA 2008) (noting also that desert washes are not consistently mapped). They occupy only a small part of the landscape but support a great deal of biodiversity.

The DPEIS underestimates the importance of aquatic and riparian habitats. "Ephemeral and intermittent streams provide the same ecological and hydrological functions as perennial streams," *id.* at iii, including wildlife habitat, support for riparian vegetation, groundwater recharge, water quality services and nesting and migratory corridors for wildlife. *See generally id.* In the Great Basin, for example, these ecosystems are small, isolated and rare, but support most of the biodiversity in the region. Don Sada, *Great Basin Riparian and Aquatic Ecosystems, in* Collaborative management and research in the Great Basin – examining the issues and developing a framework for action 49, 49 (Jeanne C. Chambers et al. eds., 2008). However, "The Great Basin is the driest region in the United States." *Id.* Riparian and aquatic ecosystems have already been dramatically altered and degraded by unsustainable uses.

There is also a lack of baseline information regarding surface and groundwater features of BLM lands targeted for the proposed SEZs . Many of the areas proposed for solar energy development fall in rural, desert areas not covered by the U.S. Geological Survey (USGS) streamflow gaging network. *Compare* Mark T. Anderson & Lloyd H. Woosley, Jr., *Water Availability for the Western United States – Key scientific challenges* Fig. 10 (U.S. Geological Survey Circular 1261, 2005) (with little to no coverage in NV/CA border region, southwestern California, southern New Mexico). Moreover, there is no national program to monitor groundwater conditions and there is little information on groundwater availability or trends in availability. *Id.* at 17. Groundwater is an important resource in the West; it may be the primary or exclusive water supply for many communities. "In the United States, ground water is the source of drinking water for 50 percent of the population and as much as 90 percent of the population in rural areas, especially in the West." *Id.*

In such arid settings, additional water demand from concentrating solar power systems employing wet-cooling could tax scarce water resources. Put in context, under "normal" conditions, 36 out of 47 state water managers anticipate water shortages in localities, regions or statewide within 10 years; under drought conditions, that number rises to 46 managers. Government Accounting Office, *Freshwater Supply, State's Views of How Federal Agencies Can Help Them Meet the Challenges of Expected Shortages* 64-65(GAO-03-514, 2003).

Many of the potentially affected ephemeral and intermittent streams are not accurately mapped, and desert washes are not consistently mapped. Levick et al., *supra* at 5. While acknowledging this lack of information, BLM improperly defers its acquisition and impacts analysis to the project-specific stage. DPEIS 4-49. Without information regarding water availability or surface water flow systems, it is difficult to choose among alternatives and even more difficult to assess claims of effective mitigation of potential impacts to water availability or to ephemeral and intermittent streams and washes. If the incomplete information is essential to choosing among alternatives and getting the information is not exorbitantly expensive, the agency shall acquire and include the information. *Id.* § 1502.22(a). If it is exorbitantly expensive or not possible to acquire the information, the agency shall inform the reader that the information is incomplete or unavailable, why the information is relevant, what relevant information is available, and what impacts the available information predicts. *Id.* § 1502.22(b).

Recommendation: The BLM should commit to thorough analysis prior to approving projects.

h. Greenhouse gas emissions

BLM must examine the potential greenhouse gas (GHG) emissions of a proposed action and its impact on climate change. *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 508 F.3d 508, 549-50 (9th Cir. 2007); *Border Power Plant Working Group v. Dep't of Energy*, 260 F.Supp.2d 997 (S.D.Cal. 2003); *Mid States Coalition for Progress v. Surface Transp. Bd.*, 345 F.3d 520 (8th Cir. 2003). *See also* 40 C.F.R. § 1502.16(e) (requiring discussion of the "[e]nergy requirements and conservation potential of various alternatives and mitigation measures" in the environmental consequences section); CEQ, *Considering Cumulative Effects Under the National Environmental Policy Act* at 24 (Jan. 1997) (identifying "[r]egional and global atmospheric alterations from cumulative additions of pollutants that contribute to global warming" as prone to cumulative effects), available at http://ceq.hss.doe.gov/nepa/ccenepa/ccenepa.htm/.

While we are pleased that BLM attempted to quantify the beneficial and adverse effects on GHG emissions, including the loss of carbon stored in desert plants and soils, BLM has overlooked several indirect sources of GHGs from each alternative over its life cycle, including vehicle use and construction impacts. BLM should also make clear whether its emission estimates for a hypothetical solar plant include emissions from supplemental power sources (natural gas or electricity) or water usage.

i. Climate change

The environmental effects analysis must build off of the climate change-affected baseline described in the affected environment. Climate change may influence (e.g., exacerbate or ameliorate) a proposed action's impact on the environment and may pose risks to the proposed action or planning area. As such, among the effects BLM must now consider are effects of the proposed action on the vulnerability of the affected environmental resources to climate change and the ability of these resources to adapt to climate change. *See* 40 C.F.R. § 1508.8 (defining 'effects' to include ecological effects, "such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems").

Taking a hard look requires federal agencies to consider climate change in NEPA documents. The latest scientific assessment from the U.S. Global Change Research Program, the body responsible for integrating and coordinating federal research on climate change, reports that "global warming observed over the past 50 years is due primarily to human-induced emissions of heat-trapping gases" and that climate-related changes have been observed and will continue. U.S. Global Change Research Program, *Global Climate Change Impacts in the United States* 9 (Thomas R. Karl et al. eds., 2009) (citing effects on the environment, human health, agriculture and other resources). The EPA has also found that the "climate change associated with elevated atmospheric concentrations of carbon dioxide and the other well-mixed greenhouse gases have the potential to affect essentially every aspect of human health, society and the natural environment." 74 Fed. Reg. 66496, 66523 (Dec. 15, 2009). Climate change is a reasonably foreseeable impact of greenhouse gas ("GHG") emissions. *Id.* at 66518 ("The scientific evidence is compelling that elevated concentrations of heat-trapping greenhouse gases are the root cause of recently observed climate change.").

BLM must consider the effect of the proposed action on climate change as well as the effect of climate change on the proposed alternatives and the effect of climate change on the affected environment. *See* Federal Leadership in Environmental, Energy, and Economic Performance, Exec. Order 13,514, 75 Fed. Reg. 52,117 (Oct. 8, 2009) (directing agencies to "develop approaches through which the policies and practices of the agencies can be made compatible with and reinforce that strategy" for U.S. adaptation to climate change, being developed by the Climate Change Adaptation Task Force); Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources, Secretarial Order 3289 (Feb. 22, 2010) (directing DOI agencies to consider and analyze climate change impacts when making major decisions affecting DOI resources), available at http://elips.doi.gov/app_so/act_getfiles.cfm?order_number=3289A1.

Based on those considerations, BLM must then assess the impact of its alternatives – including mitigation measures – on that climate-changed environment. Climate change considerations are relevant throughout the NEPA process, from the scope of the environmental document and the description of the affected environment to the design of the proposed action, its alternatives and their environmental impacts. Integration of climate change concerns into NEPA will help "mainstream" climate change mitigation and adaptation across federal programs and decision-making.

Analysis of the potential impacts of climate change on the environment is necessary to produce accurate predictions of the environmental effects of the alternatives, to assess the ability to carry out the alternatives and the effectiveness of mitigation, and to integrate climate change adaptation into the alternatives. It will also aid BLM in adequately preparing the proposed action and planning area for the inevitability of climate change.

j. Fugitive dust on snow pack

The construction phase of solar development, regardless of the alternative, will generate large quantities of fugitive dust emissions. Many parts of the study area are in non-attainment for particulate matter standards, DPEIS Fig. 4.11-4, likely due to fugitive dust sources such as unpaved roads and wind-blown dust. Site grading and vehicle travel in the arid and desert environments of the planning area will mobilize lots of dust. DPEIS, p. 4-35. BLM should assess the potential for dust-on-snow events in addition to its estimates of potential impacts on air quality. For example, snow cover duration in the San Juan Mountains was shortened by 18-25 days as a result of desert dust from the Colorado Plateau. Thomas H. Painter et al., *Impact of disturbed desert soils on duration of mountain snow cover*, 34 Geophys. Res. Lett. L12502 (2007). Changes in snowmelt timing will have biological effects as well. Heidi Steltzer et al., *Biological consequences of earlier snowmelt from desert dust deposition in alpine landscapes*, 106 Proceedings of the National Academy of Sciences 11629 (July 14, 2009). BLM must supplement its discussion of soil erosion and deposition by wind to examine the effects of land use changes on increased dust deposition onto mountain snow and reduced snow cover duration. *See* DPEIS, pp. 5-22, 5-23.

k. Significance of effects on ecological resources

BLM has not provided a reasonably thorough discussion of effects to ecological resources on the scale of the PEIS, because it does not have enough information about the context or intensity of the impacts to determine their significance. *See generally* 40 C.F.R. § 1508.27 (listing considerations that inform significant effect). For example, there is no analysis of the significance of the impacts of the likely solar development in the context of the six-state study area, seeking instead to defer to the project-specific review. *See, e.g.*, DPEIS, p. 5-63 (plant communities affected and the nature and magnitude of impacts would depend on the site-specific locations of the projects, as well as on the specific project design and the mitigation measures).

Wildlife Impacts Outside the SEZs

A meaningful comparison of the impacts of the PEIS's two action alternatives is not possible because BLM does not analyze the wildlife impacts of solar development outside of the SEZs. The principal difference between the two action alternatives is the flexibility of the Solar Energy Development Program Alternative to permit solar development on approximately 22 million acres of public lands while under the Solar Energy Zone Program Alternative development is restricted to the SEZs. In the Draft PEIS, BLM only analyzes wildlife impacts for a subset of the 22 million acres, the 677,400 acres within the proposed SEZs, and acknowledges in Appendix J that it did not attempt to compare the wildlife impacts of the Draft PEIS's two action alternatives:

> Only those species that are known to occur in the SEZ regions (i.e., within 50 mi [80km] of the SEZ centers) are discussed here in Appendix J because an expanded species analysis by alternative was identified too late during the preparation of the Draft PEIS to be accommodated in this version of the document. It is anticipated that a discussion of all species with the potential for being impacted under each alternative will be developed between the time of the Draft and Final PEISs.

DPEIS, p. J-2. However, without an analysis of wildlife impacts outside of the SEZs, the Draft PEIS does not allow agency or the public to understand the impacts of, and meaningfully distinguish between, the two action alternatives. BLM appears to recognize this critical gap in its analysis in Chapter 6 where it states:

> However, this same flexibility [of the preferred alternative] also would increase the uncertainty regarding the siting of such projects, and limit the assurance that a reduction in negative impacts would, in fact, occur. That is, this flexibility might actually increase the possibility for fragmentation of habitat, or result in greater impacts to other resource values and uses.

DPEIS, p. 6-35. We are cognizant of the practical challenge that analyzing wildlife impacts for 22 million acres of public lands presents, but, even though an agency may defer full-evaluation of site specific impacts at the programmatic EIS stage, a "programmatic EIS must provide sufficient detail to foster informed decision-making." *'Ilio'Ulaokalani Coalition v. Rumsfeld,*

464 F.3d 1083, 1095 (9th Cir. 2006) (internal quotations and citations omitted). Additionally, BLM has an obligation under 40 C.F.R. 1502.22(b) to use theoretical approaches or research methods generally accepted in the scientific community when faced with incomplete or unavailable information. Without at least a theoretical analysis of the impacts to wildlife and other ecological resources outside of the SEZs, neither BLM nor the public can meaningfully distinguish between the impacts of the action alternatives.

Special Status Species

The BLM acknowledges in the Solar PEIS that, when considering impacts to special status species, it has only evaluated data in what are termed the "SEZ regions" that are defined as within 50 miles of SEZ centers. Draft PEIS, p. J-2. The agency notes that "an expanded species analysis by alternative was identified too late during the preparation of the Draft PEIS to be accommodated in this version of the document," such that the impacts from the Preferred Alternative to special status species have not been evaluated. *Ibid*. The Draft PEIS further provides that BLM expects "that a discussion of all species with the potential for being impacted under each alternative will be developed between the time of the Draft and Final PEISs." *Ibid*. However, providing the analysis at this later point in the process will not permit the public to review and comment on either the data or the agency's analyses, both of which must be disclosed to the public as part of the Draft PEIS in order to permit the "public scrutiny" that is considered "essential to implementing NEPA." 40 C.F.R. § 1500.1(b).

Vegetation

The destruction of native vegetation communities is a significant impact, yet BLM makes no attempt to inform the reader as to the context or intensity of this impact by characterizing the "rare communities, remnant vegetation associations, endemic species, riparian areas, …." to be impacted. DPEIS, p. 5-65. This is important because these communities in arid environments are extremely sensitive, and can take decades to recover, if at all, because re-establishment may be unsuccessful in some areas.

Aquatic Habitats and Wildlife

The Draft PEIS also fails to characterize the water depletion impacts on aquatic habitats and wildlife, stating simply that impacts depend on the water source, the amount of water withdrawn and the organisms present. DPEIS 5-102. The Draft PEIS also inappropriately minimizes the impacts to aquatic habitats from groundwater withdrawal claiming that the use of groundwater during construction activities is unlikely, DPEIS 5-100, yet this claim contradicts its water resources analysis. DPEIS 5-39 ("In most areas, groundwater would likely be withdrawn from local aquifers to meet the project's water needs."). Further, it has become clear through projects that have already gone through the NEPA process that many plan to use groundwater during construction.

Upon further reading, SEZ-specific analysis does not support either claim, where, for example, the assumed perennial yield of Delamar Valley (NV) will not support the peak construction year water needs for any technology except for parabolic trough. Even here, the DPEIS does not acknowledge the shortfall. *See* DPEIS 11.2-63 ("The availability of groundwater and the potential impacts of groundwater withdrawal would need to be assessed during the site characterization phase.") Given this failure, the DPEIS does not take a hard look at whether

there is enough water to support construction or construction combined with operations or at the ecosystem impacts of that water use. Evaluation of impacts from water depletion must be conducted prior to project approval and at a sufficient regional scale to be meaningful.

Fish and Wildlife Adaptation

The PEIS fails to include any discussion of the impacts of the solar development program on the adaptation of wildlife and other ecological resources to climate change. Chapter 9 of the Draft PEIS recognizes that desert ecosystems in the American West are expected to experience rising mean temperatures and prolonged droughts during the PEIS's 20 year planning horizon. DPEIS, p. 9.1-280-81. Additionally, the proposed authorization policies in Section A.2.1.2.2 of the PEIS require that the BLM evaluate the extent to which proposed projects will impact areas that are important for adaptation to climate change. Climate change adaption is a critical mechanism for the protection of sensitive wildlife species. Despite broad reach of the PEIS to 677,400 acres of SEZs and, in BLM's Preferred Alternative, 22 million acres of BLM lands, BLM has not included a discussion and analysis of the program's impact on the climate change adaptation capability of wildlife, including, endangered or threatened species or other special status species.

l. Environmental Benefits.

The effects to be evaluated under NEPA include both costs (or damages) and benefits. 40 C.F.R. § 1508.8. In addition, when evaluating a range of alternatives, the BLM is required to consider more environmentally protective alternatives and mitigation measures. *See, e.g., Kootenai Tribe of Idaho v. Veneman*, 313 F.3d 1094, 1122–23 (9th Cir. 2002) (and cases cited therein). The consideration of more environmentally protective alternatives is also consistent with FLPMA's requirement that BLM "minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values (including fish and wildlife habitat) of the public lands involved." 43 U.S.C. §1732(d)(2)(a).

Therefore, when evaluating the impacts of various alternatives in the Solar PEIS, the BLM should explicitly discuss the benefits of protecting land (such as scenic values, clean air and water), as part of limiting development to designated SEZs.

Recommendations: The resources identified above require additional analysis of environmental consequences from utility-scale solar energy development. The Solar PEIS should highlight these resources and provide further analysis, as well as setting out clear requirements for evaluation of environmental consequences in NEPA analysis that will occur prior to project approval, including necessary updates of baseline conditions needed to conduct a meaningful analysis.

4. Cumulative impacts analysis in the Draft PEIS is not sufficient.

NEPA regulations define "cumulative impact" 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. *Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time*.

40 C.F.R. § 1508.7 (emphasis added).

Further, in determining the significance of a proposed action, BLM must consider "[w]hether the action is related to other actions with individually insignificant but cumulatively significant impacts." *Id.* § 1508.27(b)(7).

To satisfy NEPA's hard look requirement, the cumulative impacts assessment must do two things. First, BLM must catalogue the past, present, and reasonably foreseeable projects in the area that might impact the environment. *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 809–10 (9th Cir. 1999). Second, BLM must analyze these impacts in light of the proposed action. *Id.* If BLM determines that certain actions are not relevant to the cumulative impacts analysis, it must "demonstrat[e] the scientific basis for this assertion." *Sierra Club v. Bosworth*, 199 F.Supp.2d 971, 983 (N.D. Ca. 2002). A failure to include a cumulative impact analysis of actions within a larger region will render NEPA analysis insufficient. *See, e.g., Kern v. U.S. Bureau of Land Management*, 284 F.3d 1062, 1078 (9th Cir. 2002) (analysis of root fungus on cedar timber sales was necessary for an entire area).

The PEIS does not provide a sufficient cumulative impact analysis for either the study area as a whole or for sub-regions within it.

The cumulative impact discussion in the Draft PEIS is conclusory and prevents a meaningful examination of the impacts of: (1) of solar energy development at the landscape and regional level and (2) solar energy development in light of the other uses of the public lands. The BLM specifically recognized that one of the benefits of a comprehensive solar energy development program is that it "would allow the BLM to better assess potential cumulative impacts of solar energy development across the six-state study area" (DPEIS, p. 6-35), yet the agency fails to undertake this analysis in a meaningful manner.

The BLM perfunctorily dismisses cumulative impacts without an attempt to distinguish the impacts of the proposed broad, six-state program from the site-specific impacts which the Draft PEIS pledges to analyze in more detail later.[26] Additionally, the Draft PEIS merely catalogues other uses of the public lands – oil and gas, coal production, nuclear energy, renewable energy development for solar, wind, geothermal, hydroelectric, and biomass, transmission and distribution systems – without analyzing how development of solar energy might increase or exacerbate existing environmental impacts for those uses.

[26] "The PEIS does not assess site-specific issues associated with any future individual solar energy development projects. A variety of location-specific factors (e.g., soil type, watershed, groundwater availability and presence of threatened and endangered species, and the presence of cultural resources) would vary considerably from site to site, especially over a six-state region. In addition, the variations in technology and project size and design would greatly determine the magnitude of the impacts from given projects (i.e. mitigation requirements) applicable to utility-scale solar energy development in general. BLM's proposed Solar Energy Program would require that site-specific and species-specific issues be addressed during individual project reviews, where resolution of these issues is more readily achievable." DPEIS, p. ES-5.

For example, Section 6.5.2.9.2 describes the significant potential for solar development to adversely affect wildlife:

> Potentially affected wildlife in solar development areas includes numerous species of amphibians and reptiles, birds, mammals, and aquatic biota. Species would be affected by loss of habitat, disturbance, loss of food and prey species, loss of breeding areas, effects on movement and migration, introduction of new species, noise, and habitat fragmentation.

Section 6.5.2.9.2 then concludes that:

> Cumulative impacts on wildlife and aquatic biota from foreseeable development in the six-state region would be small provided mitigation measure to preserve important habitat and migration corridors are implemented (or sufficient alternative lands are set aside as compensation).

Absent from this discussion is any attempt to identify and then examine (1) the landscape and regional wildlife impacts of solar energy development or (2) the impacts of solar development that could increase or exacerbate wildlife impacts from other uses of the public lands. Section 6.5.2.9.3 concerning special status species offers a more troubling conclusion for special status species:

> Cumulative impacts from foreseeable development in the six-state region could be small to moderate for some species, with solar development being a major contributor to cumulative impacts.

Again, this section is devoid of analysis and offers nothing more than perfunctory statements. Neither Section 6.5.2.9.2 nor Section 6.5.2.9.3 allow for meaningful consideration of the cumulative impacts of the proposed solar development program by the BLM or the public. As a result, the Draft PEIS lacks meaningful information on whether or not establishing 677,400 acres of SEZs and opening 22 million acres of public lands to utility-scale solar energy development under the preferred alternative will have adverse cumulative impacts to wildlife apart from the project-scale impacts that the Draft PEIS promises to assess later.

Water resources also exemplify the need for a meaningful cumulative impacts analysis beyond that set out in the Draft PEIS. Regarding cumulative impacts on water resources, a key example for development in this arid region, the DPEIS states that "impacts on water supplies from dry-cooled solar thermal facilities and dish engine facilities would likely be minor, since such facilities would not be permitted unless studies had shown that there would be no significant impacts on the hydrologic system." DPEIS 6-93. Nevertheless, these studies will not occur until the project-specific phase. "More detailed analyses of cumulative impacts would be performed in the environmental reviews for specific projects in relation to all other existing and proposed projects in the relevant geographic area." PEIS 6-89. As such, cumulative impact analysis

deferred until such time will be unable to capture the cumulative impacts to water resources that should be within the scope of the Draft PEIS.

There are several other water resources for which there is no cumulative impacts analysis: impacts to surface water flow systems; impacts to water quality; effects of increased competition for water supplies; and effects of changing the current place of use, purpose of use, or point of diversion. In addition to the development of thousands of megawatts of solar energy, there are many other projects that will adversely affect on ephemeral and intermittent streams, increase competition for water and stress water availability, and move water from current uses in current locations to elsewhere. These projects include energy development, water development and housing development throughout the study area. The cumulative impacts to water resources in southern Nevada alone could result in declines to the groundwater table, spring discharge, wetlands and streamflow, adversely affecting twenty federally listed species and 137 other water-dependent endemic species. *See generally* James E. Deacon et al., *Fueling Population Growth in Las Vegas: How Large-scale Groundwater Withdrawal Could Burn Regional Biodiversity*, 57 BioScience 688 (2007). BLM must evaluate the effects of climate change on the potential loss of wash networks, the loss of wildlife habitat, surface water hydrology and streamflow and flood modeling.

The utility-scale solar energy development contemplated by the PEIS would have substantial effects on the other resources of the public land, as well, such as wildlife and ecosystem functionality and resilience. The size of these projects and the technologies they employ will eliminate permanently all or nearly all habitat value and other parts of functioning ecosystems - recovery time for desert ecosystems is hundreds if not thousands of years. These effects will be wide-ranging whether multiple projects are concentrated in a given area (particularly if there are sensitive resources or species) or if they are "scattered across the landscape" as proposed in the Preferred Alternative (which will degrade habitat and habitat connectivity through edge effects). The approach taken in the Ivanpah Valley highlights the risks from cumulative impacts: In a narrow movement corridor for desert tortoise, three huge projects adjacent or nearly adjacent to one another threaten to completely block a movement corridor in an area with very good tortoise habitat, and thus harmfully impact the genetic diversity of the Northeastern Mojave recovery unit.

The PEIS also fails to include an appropriate cumulative analysis for proposed zones – an approach that, had it been taken, would have allowed the agency to significantly facilitate the permitting of projects in those zones once designated and an approach that, as these comments make clear, we sincerely hope the BLM will adopt in the future. Equally importantly, however, because the PEIS did not include such an analysis, it does not reveal whether the level of development that has been projected for the proposed zones – i.e., 80% – can be sustained. While such an analysis may not be as critical in some areas – e.g., in zones in which there are currently no applications pending it is certainly critical in others. The best example of such a needed analysis is the Riverside East zone proposed for the California Desert Conservation Area. As of March 7, 2011, there are a total of 25 ROW applications pending for that proposed zone, 11 of which are "first in line." Two projects were approved in this zone last year and the permitting process is close to completion for at least two more projects. BLM and others are questioning whether this zone has already reached its capacity. Without a more in-depth analysis of

cumulative impacts and the effects on projected development in the SEZs, which this PEIS does not even purport to provide, vital questions cannot be answered.

Recommendations: In order to evaluate and approve utility-scale solar energy development, BLM must conduct a meaningful analysis of the cumulative impacts of this development at a landscape scale. The Final PEIS should include additional cumulative impacts analysis, especially for water resources, and should also set out specific parameters for cumulative impact analysis to be conducted for other resources.

5. The Draft PEIS presents limited baseline information, which restricts the analysis of potential impacts.

NEPA requires agencies to "describe the environment of the areas to be affected or created by the alternatives under consideration"; so agencies must establish baseline conditions. 40 C.F.R. § 1502.15. In *Half Moon Bay Fisherman's Marketing Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988), the Ninth Circuit states that "without establishing . . . baseline conditions . . . there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA." The court further held that "[t]he concept of a baseline against which to compare predictions of the effects of the proposed action and reasonable alternatives is critical to the NEPA process."

As noted above, the Solar PEIS concedes that collection of baseline data has been deferred, such as the data for special status species outside the SEZs. Until an adequate baseline is established, the BLM cannot evaluate impacts, determine the mitigation measures needed to address those impacts, or conclude that specific actions will not have a significant impact and approve them. This is the major reason why – as stated above – BLM cannot choose its Preferred Alternative (the Solar Development Alternative) on the basis of the draft PEIS as written.

a. Water availability

The Draft PEIS does not take into account the various legal structures that determine water availability. These need to be taken into account. For example, New Mexico law allows the State Engineer to provide legal protection to flows for fish, wildlife or other ecological uses. *See* Opinion of Tom Udall, Attorney General, Opinion No. 98-01 (March 27, 1998); *compare* DPEIS 4-60 ("New Mexico has no state laws governing flows, and they are not recognized as a beneficial use in the state."). BLM also needs to update its discussion of New Mexico water management and other analyses as a result of successful legal challenges to the state's Active Water Resource Management program. DPEIS 4-63, 4-75, 12.1-73-74, 12.1-80, 12.2-61-62, 12.2-68, 12.3-54-65.

BLM's discussion of water resources and their management in Nevada suffers many of the same flaws. In the volume on Nevada's proposed energy zones, the DPEIS portrayal of the available water supply in two zones is greatly overstated due to failure to understand the full meaning of recent court decisions. BLM should revise its discussions and assumptions regarding water use and water rights management in Delamar and Dry Lake Valley North, *see, e.g.*, DPEIS at 11.2-

60—61, 11.2-65, 11.2-67, 11.2-336, 11.4-63, 11.4-67, to clarify that State Engineer Ruling 5875 has been vacated and that the perennial yield newly established in Ruling 5875 and water rights granted to SNWA have also been vacated. As a result, the DPEIS baseline analysis should reflect that the basins are fully appropriated. *Carter-Griffin v. Taylor*, CV 0830908 (Oct. 15, 2009), slip op. at 5 (citing Ruling 5875) ("all water rights previously available in [Delamar and Dry Lake Valley basins] had already been fully appropriated"). Note also that the Colorado River Compact does not entitle Nevada to 300,000 acre-feet/year, DPEIS 4-73; Nevada's Colorado River apportionment derives from the Boulder Canyon Project Act and the Consolidated Decree in *Arizona v. California*. The same holds true for California's Colorado River apportionment. *See* DPEIS 4-68 (stating California's apportionment comes from the Colorado River Compact).

Although there are a number of state laws and policies for managing water resources, the DPEIS fails to mention several directly applicable to water use for energy generation. BLM should discuss these requirements, because an action that may violate federal or state law or other requirements for environmental protection, *see id.* § 1508.27(b)(10), may have a significant impact. *See also id.* § 1502.16(c) (environmental effects section shall include discussions of possible conflicts between the proposed action and federal, state, local or tribal plans, policies or controls for the area); *id.* § 1506.2(d) (requiring discussion of any inconsistency with state or local plans or laws and of the extent to which the proposed action will be reconciled with the plan or laws).

For example, the Nevada State Engineer has expressed a clear preference for air-cooled power plants in its water permitting decisions. In Nevada, water rights applications for water to support utility-scale power plants were granted because the plants were to use "water efficient, air-cooled technology" – "realistic power generation projects" – and water use in this context was reasonable. State Engineer Ruling No. 5008, dated March 20, 2001, at p.24-25, 40, available at http://images.water.nv.gov/images/rulings/5008r.pdf?CFID=170013&CFTOKEN=49614454. A year later, as the Nevada State Engineer considered water rights applications for which a potential use was a water-cooled power plant, he recognized that "Technology is available, which can produce significant amounts of electricity using air-cooled systems. This technology uses significantly less quantities of water. … The State Engineer … does not believe it is prudent to use substantial quantities of newly appropriated ground water for water-cooled power plants in one of the driest places in the nation, particularly with the uncertainty as to what quantity of water is available from the resource, if any." State Engineer Ruling No. 5115, dated April 18, 2002, at p.25, available at http://images.water.nv.gov/images/rulings/5115r.pdf.

The California Energy Commission and California State Water Resources Control Board also discourage fresh water use for power plant cooling. *See* California Energy Comm'n, *2003 Integrated Energy Policy Report* 39-41 (2003), available at http://www.energy.ca.gov/reports/100-03-019F.PDF; State Water Resources Control Board Resolution 75-58, *Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling*, June 19, 1975, p. 1. http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1975/rs75_058.pdf. As a result, all solar thermal projects permitted on public lands in California in 2010 were dry-cooled.

b. Aquatic Biota

The final PEIS should provide greater context to highlight the scarcity of and stress to water resources in the planning area. Both the main volume and state-specific volumes contain extremely little information about the existing flow systems, their status and the importance. In the six-state area, intermittent and ephemeral streams make up "over 81% [of all streams] in the arid and semi-arid Southwest (Arizona, New Mexico, Nevada, Utah, Colorado and California)." Levick, L. et al., *The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest* iii (EPA 2008) (noting also that desert washes are not consistently mapped). They occupy only a small part of the landscape but support a great deal of biodiversity.

The DPEIS underestimates the importance of aquatic and riparian habitats. "Ephemeral and intermittent streams provide the same ecological and hydrological functions as perennial streams," *id.* at iii, including wildlife habitat, support for riparian vegetation, groundwater recharge, water quality services and nesting and migratory corridors for wildlife. *See generally id.* In the Great Basin, for example, these ecosystems are small, isolated and rare, but support most of the biodiversity in the region. Don Sada, *Great Basin Riparian and Aquatic Ecosystems, in* Collaborative management and research in the Great Basin – examining the issues and developing a framework for action 49, 49 (Jeanne C. Chambers et al. eds., 2008). However, "The Great Basin is the driest region in the United States." *Id.* Riparian and aquatic ecosystems have already been dramatically altered and degraded by unsustainable uses.

There is also a lack of baseline information regarding surface and groundwater features of BLM lands targeted for SEZs. Many of the areas proposed for solar energy development fall in rural, desert areas not covered by the USGS streamflow gauging network. *Compare* Mark T. Anderson & Lloyd H. Woosley, Jr., *Water Availability for the Western United States – Key scientific challenges* Fig. 10 (U.S. Geological Survey Circular 1261, 2005) (with little to no coverage in NV/CA border region, southwestern California, southern New Mexico). Moreover, there is no national program to monitor groundwater conditions and there is little information on groundwater availability or trends in availability. *Id.* at 17. Groundwater is an important resource in the West; it may be the primary or exclusive water supply for many communities. "In the United States, ground water is the source of drinking water for 50 percent of the population and as much as 90 percent of the population in rural areas, especially in the West." *Id.*

In such arid settings, additional water demand from concentrating solar power systems employing wet-cooling could tax scarce water resources. Put in context, under "normal" conditions, 36 out of 47 state water managers anticipate water shortages in localities, regions or statewide within 10 years; under drought conditions, that number rises to 46 of 47 managers. Government Accounting Office, *Freshwater Supply, State's Views of How Federal Agencies Can Help Them Meet the Challenges of Expected Shortages* 64-65(GAO-03-514, 2003).

Many of the potentially affected ephemeral and intermittent streams are not accurately mapped, and desert washes are not consistently mapped. Levick et al., *supra* at 5. While acknowledging

this lack of information, BLM improperly defers its acquisition and impacts analysis to the project-specific stage. DPEIS 4-49. Without information regarding water availability or surface water flow systems, it is difficult to choose among alternatives and even more difficult to assess claims of effective mitigation of potential impacts to water availability or to ephemeral and intermittent streams and washes. If the incomplete information is essential to choosing among alternatives and getting the information is not exorbitantly expensive, the agency shall acquire and include the information. 40 C.F.R. § 1502.22(a). If it is exorbitantly expensive or not possible to acquire the information, the agency shall inform the reader that the information is incomplete or unavailable, why the information is relevant, what relevant information is available, and what impacts the available information predicts. *Id.* § 1502.22(b).

c. Climate change

BLM has failed to include climate change projections in its description of the affected environment so that it may adequately identify direct, indirect and cumulative effects. The long-term duration of the program and individual projects – 20 years – speak to the need to consider how the effects of climate change may intensify over time. Moreover, review at a programmatic level lends itself to climate change projections that can be made at a regional scale. Although the DPEIS acknowledges that such an analysis may be necessary in this section, *see* DPEIS at 4-1 (noting that "[f]actors such as climate change that may have an influence on the current conditions and potential trends of individual resources and resource uses have been incorporated as appropriate …"), it devotes a mere four sentences to climate change impacts on resources throughout the chapter. *See* DPEIS at 4-59 (observing that there may be variations in water supply and use); DPEIS at 4-132 (summarizing adverse effects on the range of resources). BLM repeats much of this information in the cumulative impacts assessment. DPEIS 6-87. The summary provided offers no information on <u>impacts</u> or <u>trends</u>; information on trends and how they manifest on water resources and ecosystems are below. "The past century is no longer a reasonable guide to the future for water management." U.S. Global Change Research Program, *Global Climate Change Impacts in the United States* 49 (Thomas R. Karl et al. eds., 2009)[hereinafter USGCRP].

The PEIS should include observed <u>and</u> projected impacts of climate change in the region – considering whether climate change has affected, is affecting, or will in the future affect each resource and incorporating that information into the discussion of each resource. Federal and state agencies have published reports, studies and plans that identify the observed and projected impacts of climate change on specific geographic areas or environmental resources and that are readily available to BLM. BLM must consider the following impacts of climate change on the affected environment.

(i) Soils

BLM must supplement its discussion of soil erosion due to water and surface runoff (*see, e.g.*, DPEIS 5-23) to consider increased runoff from more extreme storms in a climate-changed environment. Climate change will lead to an intensified hydrologic cycle, including more extreme rainfall events. *See* Zbigniew W. Kundzewicz et al., *Freshwater resources and their*

management, in Climate Change 2007: Impacts, Adaptation and Vulnerability, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change 173, 175 (M.L. Parry et al., eds. 2007). Increasing trends in extreme precipitation events have already been observed in the Southwest and climate change may be the cause. *See* Kenneth E. Kunkel et al., *Long-term trends in Extreme Precipitation Events over the Conterminous United States and Canada*, 12 J. of Climate 2515 (1999); Kenneth E. Kunkel, *North American Trends in Extreme Precipitation*, 29 Natural Hazards 291 (2004). Increased intensity of rainfall events will lead to increased erosion from increased rainfall and in combination with other climate-related factors such as changes in soil moisture, plant cover and shifts from snow to rain. One study indicated that a 1% change in total precipitation (due to climate change alone, and not considering land use or other changes) could affect a 1.7% change in soil erosion. F.F. Pruski & M.A. Nearing, *Runoff and soil loss responses to changes in precipitation: a computer simulation study*, 57 J. of Soil and Water Conservation 7 (2002).

BLM must assess the impacts of proposed land use changes – construction on thousands of acres of desert soils – on the hydrology of the affected environment in an environmental setting that contemplates the impacts of climate change. The potential removal of desert wash networks over thousands of acres would eliminate their hydrological and biological functions and impede wildlife movement through the washes. An increase in the frequency or duration of extreme rainfall events may change upstream and downstream surface water features, soil moisture and the frequency and characteristics of flow and flood events.

The Bureau must also assess impacts of the proposed construction on desert crusts, especially on cryptobiotic soils essential to desert ecosystem functions, as discussed in further detail in the state-specific comment submitted separately.

(ii) Water resources

Numerous federal publications expand on the DPEIS's observation that climate change may modify water supply and use by actually explaining how the surface and groundwater resources in the planning area may be affected over the next decades by changes in precipitation patterns. For example, the IPCC has projected likely reductions in snowpack, seasonal shifts in runoff patterns, declines in groundwater recharge, and an increased frequency of intense precipitation events, such as flash floods, in the western and southwestern U.S. IPCC, 2007, *supra*. *See also* USGCRP, *supra* at 42 ("the arid Southwest is projected to experience longer and more severe droughts from the combination of increased evaporation and reductions in precipitation"); *id.* at 44 (16% increase in average number of days with very heavy precipitation); *id.* at 44 (extended dry periods have become more frequent in the Southwest and "[l]onger periods between rainfalls, combined with higher air temperatures, dry out soils and vegetation …"); *id.* at 45 (projecting substantial declines in the interior West, especially the Southwest, in runoff); *id.* at 46 (projecting advances in spring runoff by up to 60 days; earlier spring runoff leads to reduced summer flows); *id.* at 47 (changes in water cycle will affect groundwater recharge).

These same publications discuss the potential changes in water quality as a result of climate change. The IPCC predicts that increased water temperatures will put additional stress on aquatic species. IPCC, 2007, *supra*. *See also* USGCRP, *supra* at 46 (higher water

temperatures); *id.* at 46 (increases in storm intensity and reductions in summer streamflow contribute to higher concentrations of pollutants); *id.* at 46 (heavier storms increase runoff, sedimentation and flushing of pollutants into waters).

Additional federal sources explain how the transformations driven by climate change will redistribute stream flow and wetlands in the Great Basin, one of the basins within the planning area:

> Ongoing climate change will have significant effects on the timing and amount of available water in this arid to semi-arid region (Wagner 2003, CIRMOUNT Committee 2006). Under warming trends, a larger fraction of precipitation will come as rain, and the region's snow packs will melt earlier, yielding higher winter and spring runoff rates and less summer runoff. Spring snowmelt is already occurring weeks earlier than in past decades and more precipitation falls as rain in much of the region. Continuation of these trends will result in increased winter floods in some basins, smaller warm-season reserves and rates of runoff, and warmer water temperatures in many of the region's rivers and lakes. In summer, lower flows coupled with higher variability may negatively affect various water uses including hydropower, irrigation, fish, and recreation. … Areas with increasing dryness will exhibit a decrease in groundwater recharge, decreasing the longevity of groundwater resources.

Jeanne C. Chambers, *Water resources in the Great Basin, in* Collaborative management and research in the Great Basin – examining the issues and developing a framework for action 20, 20 (Jeanne C. Chambers et al. eds., 2008).

> A reasonable scenario for western stream flows is change in the current seasonal proportionality of flows: increased winter flow, reduced and earlier spring peaks, and reduced summer and fall flows. The change in absolute flows will depend on the actual increase in precipitation relative to the degree of warming and its effects on evapotranspiration. Most watersheds in the Great Basin exhibit high natural variability in unregulated streamflow (Hurd and others 1999) and this variability may increase. In summer, lower flows coupled with higher variability may negatively affect various water uses (hydropower, irrigation, fish, recreation, and so forth).

Jeanne C. Chambers, *Climate Change and the Great Basin, in* Collaborative management and research in the Great Basin – examining the issues and developing a framework for action 29, 30 (Jeanne C. Chambers et al. eds., 2008).

(iii) Ecosystems

The IPCC has stated broadly that, "Responses of terrestrial species to warming across the Northern Hemisphere are well documented by changes in the timing of growth stages (i.e., phenological changes), especially the earlier onset of spring events, migration, and lengthening of the growing season." IPCC, 2007: Climate Change 2007: Impacts, Adaptation, and

Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E. (eds.)]. Cambridge University Press, Cambridge, United Kingdom, 1000 pp.

Arid environments like those studied here are likely to become even hotter and drier; in fact, this is already being observed. USGCRP, *supra* at 83. The ranges of many species in the United States have shifted northward and upward in elevation. *Id.* at 80. Communities of species will shift as a whole, breaking up existing ecosystems, and some migratory corridors may be blocked. *Id.* at 81.

(iv) Vegetation

Earlier average bloom dates for plants have already been observed. Jeanne C. Chambers, *Climate Change and the Great Basin, in* Collaborative management and research in the Great Basin – examining the issues and developing a framework for action 29, 29 (Jeanne C. Chambers et al. eds., 2008).

(v) Invasive species

Rising air temperatures can increase pest outbreaks. USGCRP, *supra* at 82. Many invasive plant species can tolerate higher temperatures of climate change and may grow faster than natives. *Id.* at 83. In the Great Basin, researchers predict that higher levels of CO2 may increase the invasibility of cheatgrass and other annual grasses. Other invaders, including perennial forbs and woody species, may be similarly advantaged. Jeanne C. Chambers, *Climate Change and the Great Basin, in* Collaborative management and research in the Great Basin – examining the issues and developing a framework for action 29, 30 (Jeanne C. Chambers et al. eds., 2008).

d. Water Quality

BLM should provide more information in the Final PEIS that includes a robust inventory of surface and groundwater quality in the planning area. There is nothing but a brief, general statement about water quality in each of the nine aquifers, *see, e.g.*, DPEIS Table 4.9-4 (groundwater generally good in the Pacific Northwest, not known in the Texas-Gulf), with similarly terse statements regarding surface water quality. *See* DPEIS Table 4.9-1. Additional information will inform a comparison of alternatives, to discern the water treatment needs for solar energy facilities (e.g., for potable supply, for mirror washing), the resultant wastewater treatment needs, the environmental impacts of any water treatment, or the effectiveness of proposed mitigation.

Recommendations: BLM has conceded that the Solar PEIS does not set out a sufficient baseline of conditions on the public lands that are made available for solar energy development. In order to comply with NEPA's requirement to evaluate impacts starting from an accurate description of the affected environment, the PEIS must set out specific requirements for describing an accurate

baseline of resources and conditions so that impacts can be evaluated at a landscape level prior to project approval.

5. Mitigation measures must be described with specificity and must include commitments for action.

NEPA requires that BLM discuss mitigation measures in an EIS. 40 C.F.R. §§ 1502.14, 1502.16. Simply identifying mitigation measures, without analyzing the effectiveness of the measures, violates NEPA. Agencies must "analyze the mitigation measures in detail [and] explain how effective the measures would be . . . A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA." *Nw. Indian Cemetery Protective Ass'n v. Peterson*, 764 F.2d 581, 588 (9th Cir. 1985), *rev'd on other grounds*, 485 U.S. 439 (1988). NEPA also directs that the "possibility of mitigation" should not be relied upon as a means to avoid further environmental analysis. Council on Environmental Quality, *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, available at* http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm; *Davis v. Mineta*, 302 F.3d at 1125.

Further, general statements that BLM will conduct monitoring are also not an appropriate form of mitigation. Simply monitoring for expected damage does not actually reduce or alleviate any impacts. Only the taking of appropriate actions based on monitoring results can reduce impacts. The Draft PEIS fails to set out mitigation goals or requirements for special status species, for example, simply stating that an Ecological Resources Mitigation and Monitoring Plan should include: "Measures to mitigate and monitor impacts on special status species developed in coordination with the appropriate federal and state agencies (e.g., BLM, USFWS, and state resource management agencies)." DPEIS, p. 5-134.

As discussed in recent guidance issued by the Council on Environmental Quality (CEQ) addressing the "Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact,"[27] specific commitments are needed for meaningful use of mitigation measures.

As CEQ describes it:

> Specifically, the guidance affirms that agencies should:
> - commit to mitigation in decision documents when they have based environmental analysis upon such mitigation (by including appropriate conditions on grants, permits, or other agency approvals, and making funding or approvals for implementing the proposed action contingent on implementation of the mitigation commitments);
> - monitor the implementation and effectiveness of mitigation commitments;
> - make information on mitigation monitoring available to the public, preferably through agency web sites; and
> - remedy ineffective mitigation when the Federal action is not yet complete.

Thus, in the context of the Solar PEIS, the guidance requires commitment to actual mitigation measures that the BLM has reason to believe will be effective, monitoring of actual

[27] Available at: http://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa

effectiveness, publication of monitoring data, and action to address ineffective mitigation. If monitoring shows that mitigation measures are not effectively avoiding or reducing or compensating for environmental impacts, then new actions must be taken to mitigate harms or the damaging activities associated with solar energy development must be stopped until new measures can be evaluated and developed.

Further, the guidance states:

> CEQ encourages agencies to commit to mitigation to achieve environmentally preferred outcomes, particularly when addressing unavoidable adverse environmental impacts. Agencies should not commit to mitigation, however, unless they have sufficient legal authorities and expect there will be necessary resources available to perform or ensure the performance of the mitigation.

Guidance, p. 5. Consequently, the BLM must also take into account the likelihood that it will have the funding and resources necessary to implement mitigation measures, as one aspect of ensuring that these measures are likely to be successful. In California, the BLM is trying to establish a comprehensive monitoring program that includes "before" monitoring at project and reference sites; and careful consideration should be given to expanding their efforts across all public lands that will be affected by solar development.

To support the BLM's assertion that its "comprehensive set of mitigation requirements would ensure that impacts from solar energy development on BLM-administered lands would be mitigated to the fullest extent possible," DPEIS, p. 6-104, the final PEIS must provide data and analysis that demonstrate why the proposed mitigation measures/design features will "constitute an adequate buffer against the negative impacts that may result from the [proposed alternatives]." *Nat'l Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 734 (9th Cir. 2001). Critical to the assessment of environmental effects is an analysis of the effectiveness of proposed mitigation measures – this assessment is lacking in this DPEIS. This gap would be partly addressed by setting goals and adding further discussion of potential compensatory mitigation as described below, but we also add the following comments:

a. Analysis is required to support effectiveness of mitigation.

Frequently, the Draft PEIS states that mitigation <u>will</u> minimize impacts, but offers no supporting analysis. *See, e.g.*, DPEIS, p. ES-18 (Impacts to groundwater and surface water flow systems, water contamination, water quality degradation by runoff or excessive withdrawals "can be effectively mitigated"; DPEIS, pp. 5-24, 5-25, 5-26 (mitigation measures would reduce the level of impacts to soils from site characterization, construction, operations and decommissioning); DPEIS 5-41 (mitigation measures relating to site design, stormwater, and avoidance of critical landscapes would reduce impacts relating to altered hydrology); DPEIS, pp. 11.1-61, 11.2-62, 11.4-64 (land disturbance impacts to water resources "will be minimized"); DPEIS, Tables 5.10-1, 5.10-2, 5.10-3, 5.10-4 (claiming an ability to mitigate impacts to ecological resources). Each section of design features is "at best a 'mere listing' of mitigation measures, without supporting analytical data." *League of Wilderness Defenders v. Forsgren*, 309 F.3d 1181, 1192 (9th Cir. 2002) (quoting *Okanogan Highlands Alliance v. Williams*, 236 F.3d 468, 473 (9th Cir. 2000)).

In fact, a closer reading of the DPEIS reveals that BLM cannot be sure which mitigation measures will be implemented or that they will be effective; and if ineffective, that other mitigation measures will be put in place. The final PEIS must contain analyses that estimate how or to what extent mitigation will reduce impacts – BLM must "show its work" as well as acknowledge the need for site-specific analysis showing that a specific BMP will in fact produce the intended result if a proposed project is approved.

In the final EIS, to show whether and how mitigation will work, BLM must provide a more accurate assessment of environmental effects and must temper its conclusions that impacts will be mitigated when it does not have supporting data. Before selecting and implementing an action alternative, BLM must have a better understanding of its ability to mitigate significant impacts. NEPA "requires the Federal agencies to assess the environmental consequences of their actions *before* those actions are undertaken." *Klamath-Siskiyou Wildlands Ctr. v. BLM*, 387 F.3d 989, 993 (9th Cir. 2004) (emphasis added).

In many cases, the type of mitigation and the actual ability to mitigate significant impacts to environmental resources will not be known until BLM reviews specific projects. "Actual ability to mitigate impacts will depend on site-specific conditions and the communities present in the project area." DPEIS, Table 5.10-1 (vegetation); DPEIS, Table 5.10-2 (wildlife); DPEIS, Table 5.10-3 (aquatic resources). *See also* DPEIS, p. 5-2 ("Their [mitigation measures] applicability and effectiveness cannot be fully assessed except at the project-specific level when the project location and design are known."); DPEIS, p. 6-104 ("Any potential adverse impacts that could not be addressed at the programmatic level would be addressed at the project level, where resolution of site-specific and species-specific concerns is more readily achievable."). In other cases, assertions that impacts can or will be effectively mitigated are contradicted by statements elsewhere in the DPEIS. *See, e.g.*, DPEIS Tables 5.10-1, 5.10-2, 5.10-3, 5.10-4 (noting that overall it is relatively difficult to mitigate impacts to ecological resources).

Built off of BLM's Special Status Species Policy and BLM's ESA Section 4(a)(1) affirmative obligations to conserve and recover listed species, the final PEIS should be used to promulgate goals that will provide clarity to project developers and the public on how mitigation requirements will be developed and analyzed. In particular, mitigation measures should be specific to the wildlife species and other resource impacts that will occur. BLM offices need a clear standard for review of mitigation projects that require a clear description and quantification of wildlife impacts and offsets.

b. Monitoring is critical to mitigation effectiveness.

DOI agencies have too often failed to establish clear and measurable biological goals in their own work and in requirements of third parties seeking agency approval. The absence of goals feeds into problems with inadequate monitoring. The result is that too many projects fail to adequately compensate for impacts, and DOI agencies have a poor record of being able to track such performance.

The Draft PEIS lacks assurances that mitigation measures will be implemented and monitored. CEQ recommends that any agency NEPA analyses and/or decision documents should:

- describe the expertise applied in determining appropriate mitigation commitments;
- consider when and how mitigation commitments will be implemented;
- specify measurable performance standards or expected results of mitigation commitments as well as the timeframe for the agency action and mitigation commitments;
- disclose if it is reasonably foreseeable that funding for mitigation measures may not be available and, if so, the resultant environmental effects;
- identify alternative mitigation measures if the initial commitments are not implemented or effective; and
- describe monitoring plans and programs, the agency and/or applicant responsible for developing and implementing the monitoring program and the monitoring area and appropriate monitoring system.

See Final Guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact, 76 Fed. Reg. 3843 (Jan. 21, 2011). BLM should apply these recommendations to the DPEIS.

BLM must use the final PEIS to define the types of outcomes (population size, viability, reproductive performance, age class distribution, etc.) that it will require. Additional final PEIS analysis should describe the expected results of mitigation and how it will serve to guide any monitoring program that BLM and applicants implement. "Monitoring is fundamental for ensuring the implementation and effectiveness of mitigation commitments, meeting legal and permitting requirements, and identifying trends and possible means for improvement." 76 Fed. Reg. at 3849. BLM must establish clear requirements for monitoring and reporting – to the public and the agency – on the success in achieving those goals. Public reporting should document whether the monitoring program should track whether mitigation commitments are being performed as described in NEPA analyses and whether the mitigation is producing the expected outcomes and environmental effects. The monitoring program should also provide for public involvement. 76 Fed. Reg. at 3851.

Moreover, many of the design features rely on monitoring alone as mitigation plans. *See, e.g.*, DPEIS, pp. A-48—A-50 (requiring a variety of hydrologic studies and monitoring plans). However, none of these monitoring plans call for changes in water use should the monitoring reveal adverse effects to water resources, sensitive habitats or special status species; the agency and the public must be able to determine, *in advance*, the appropriateness and effectiveness of mitigation commitments. "Monitoring may serve to confirm the appropriateness of a mitigation measure, but that does not make it an adequate mitigation measure in itself." *Nat'l Parks & Conservation Ass'n*, 241 F.3d at 734. To truly ensure that these impacts are avoided, the mitigation plans must include conservation measures informed by the monitoring results.

c. Mitigation measures must be sufficiently robust to address the extensive impacts of utility-scale solar energy development.

It is critical to note that the kinds of impacts these massive projects will cause in desert environments are essentially permanent and will persist far beyond the site's use for energy

production, despite "remediation" commitments. Thus, mitigation measures must be planned and funded to last in perpetuity, not subject to change via land use plan amendments, budget cuts and other impacts.

d. Adaptive management, as part of mitigation, must be conducted using a detailed framework.

The Draft PEIS also states that the BLM will rely on adaptive management so that new data and lessons learned can be addressed on an ongoing basis. DPEIS, pp. 2-5 and 2-6. In order for BLM to rely on actions to be taken through adaptive management to mitigate impacts from solar energy development, there must be a concrete and detailed adaptive management plan. The key elements of a meaningful adaptive management plan, as well as appropriate monitoring, are discussed in further detail below in Section 1.III.D of these comments.

In addition to the specific changes to the mitigation measures recommended in Section 1.I above, the PEIS must also evaluate the likelihood of effectiveness based on the criteria set out above and must incorporate a detailed adaptive management plan framework.

e. Monitoring results and actions must be made public.

Lastly, the ROD must include an unambiguous commitment to making monitoring data available to the public at the same time it is received by the agency. Information about the ongoing impacts of these projects on publicly-owned resources is not confidential or propriety and making it public is key to the BLM's goal of having an environmentally responsible solar program.

Recommendations: BLM cannot rely on mitigation measures without a reasoned evaluation and conclusion that they will be successful. Monitoring and adaptive management cannot substitute for mitigation, but must be part of BLM's detailed, science-based commitments to action. The Solar PEIS, the ROD and Solar Energy Program should require evaluation of mitigation measures and commitments to monitoring and adaptive management to ensure that they are successful or, if they are not, that new measures are implemented or development activities are changed. In addition, BLM should commit to making all monitoring information, as well as adaptive management actions taken in response to monitoring results, public.

B. BLM Wildlife Policy

1. The Draft PEIS analysis of impacts on special status species is not adequate to reveal whether implementation of the proposed program will be consistent with agency policy to conserve those species

BLM's Special Status Species policy states that the agency "shall manage Bureau sensitive species and their habitats to minimize or eliminate threats affecting the status of the species or to improve the conditions of the species habitat…."Manual 6840.2C. The policy then enumerates the specific means to achieve these objectives, including through "evaluating the significance of BLM-administered lands and actions undertaken by the BLM in conserving those species"(

6840.2C1) and ensuring that "BLM activities affecting Bureau sensitive species are carried out in a way that is consistent with its objectives for managing those species and their habitats at the appropriate spatial scale." 6840.2C2. The policy even goes beyond species that currently have special status species protection and instructs the BLM to "[c]onsider ecosystem management and the conservation of native biodiversity to reduce the likelihood that any native species will require Bureau sensitive species status." 6840.2C7.

While the Draft PEIS acknowledges the severe risk posed to special status species by large scale solar development, especially under the Preferred Alternative, the analysis it contains is inadequate to reveal whether implementation of the program will be consistent with Special Status Species policy. [28]

First, as stated above, the analysis of impacts to special status species outside of zones is insufficient. The BLM acknowledges in the Solar PEIS that, when considering impacts to special status species, it has only evaluated data in limited "SEZ regions" and hopes to have additional data and analyses prepared before the final PEIS is released. [29] DPEIS, p. J-2. As noted above, providing the analysis at this later point in the process will not permit the public to review and comment on either the data or the agency's analyses, both of which must be disclosed to the public as part of the Draft PEIS in order to permit the "public scrutiny" that is considered "essential to implementing NEPA." 40 C.F.R. § 1500.1(b).

Second, the analysis that was conducted for impacts to special status species within the zones is not conducted at the appropriate biological scale. BLM special status species policy focuses conservation actions at the population scale of analysis, and notes other key parameters such as species distribution and abundance for covered species that should be considered and employed when assessing the impacts of the solar program. For example, BLM is required to inventory the public lands to determine the "condition of the *populations* and their habitats, and how discretionary BLM actions affect those species and their habitats" 6849.04D.3. The policy also calls for population monitoring of special status species to "determine whether management objectives are being met" 6840,04E.7. Furthermore, the policy states that the agency will "manage Bureau sensitive species and their habitats to minimize or eliminate threats affecting the status of the species by…determining, to the extent practicable, the distribution, abundance, population condition, current threats, and habitat needs for sensitive species, and evaluating the significance of BLM-administered lands and actions by the BLM in conserving those species" 6840.2C.1.

The Draft PEIS's analysis does not reveal population level impacts; it acknowledges that these impacts will occur. For example, it states that "because of their small population sizes and often specialized habitat needs or dependence on rare habitats, special status species may be more vulnerable to impacts than common and widespread species. *Small population size* makes them more vulnerable to the effects of habitat fragmentation, habitat alteration, habitat degradation, human disturbance and harassment, mortality of individuals, and the loss of genetic diversity.

[28] Federally listed as threatened or endangered under the Endangered Species Act (ESA); candidate or proposed for listing under the ESA; BLM-designated sensitive; state-listed as either endangered, threatened, or a species of special concern; or a rare species as defined by a state rank of S1 or S2.
[29] As noted above, these "regions" are comprised of the lands within 50 miles of the centers of the proposed SEZs.

DPEIS, p. 5-114 (emphasis added). Despite this overarching statement and clear acknowledgement of risk to wildlife populations, however, the draft PEIS fails to conduct a meaningful vulnerability analysis of the effects of habitat fragmentation, alteration and degradation on populations of special status species. Furthermore, the proposed program does not clearly define how these risks will be defined, avoided, minimized and mitigated during program implementation. More specifically, it does not clarify whether population level effects will be meaningfully assessed at the project scale.

Instead, and despite the fact that the population condition of wildlife species is a key attribute of agency policy, the draft PEIS provides an extremely broad analysis of potential impacts to ecological resources and wildlife. The draft PEIS acknowledges that construction and operation is likely to result in habitat disturbance "that could result in major impacts to wildlife", including the loss and fragmentation of habitat, resulting in "loss of genetic interchange among populations" and impacts to "local wildlife composition and abundance" as well as loss of "local wildlife composition and abundance" DPEIS, p. 5-74. Although the PEIS concludes that impacts will be "large," assuming no mitigation, assessment of actual impact magnitudes on wildlife is deferred until the project scale of analysis.[30] DPEIS, Table 5.10-4. It is unclear, however, whether or how the population level impacts will be assessed at a project scale.

Rather than providing mere agency assurances that actual impacts will be effectively evaluated at a later planning stage, the analysis in the draft PEIS could have been conducted in a more meaningful manner. While the analysis of relative impact magnitudes relies on numerous assumptions, two are of particular concern. First, in determining whether impacts are categorized as none, small, moderate, or large, the draft PEIS uses a "landscape-level analysis" based on the percentage of a sensitive species' *population* **or** *suitable habitat* that would be lost in an SEZ region. If this analysis were to be based on population-level impacts, or otherwise constructed so as to allow meaningful inference to risks posed to individual species persistence, we believe that reasonable conclusions could be drawn about the risks the program presents to a species' chances of being listed under the ESA, in accordance with BLM wildlife policy. For many sensitive species, however, the draft PEIS relies on broad habitat-level impacts. The PEIS fails to demonstrate a connection between the estimated habitat-level impacts and actual risks to a species conservation status, and is therefore not adequate to demonstrate compliance with BLM wildlife policy. In other words, for many sensitive species, the Draft PEIS provides no useful information about how much closer the solar program places these species toward an ESA listing.

The second notable flaw with the special status species analysis is the use of a 50-mile radius to determine the relative impact magnitude for all special status species. Depending on the type of species, a 50-mile radius could represent a small portion of the species' range, the species' entire range, or anything in between. For example, rare endemic plants have far more restricted ranges

[30] A "large" impact is defined as "effects are clearly noticeable and are sufficient to destabilize important attributes of the resource (e.g. > 10% of the population or its habitat would be lost in the region.)" (5-96). Despite the reference to population level effects, we found no evidence that the draft PEIS actually attempted to estimate them. Furthermore, the reference to "population" in this criterion is misplaced; there is no evidence that population level effects were assessed.

than birds; impacts to the former would be of greater concern than impacts to the latter. The draft PEIS, however, does not specifically distinguish among these species and thus may both underestimate and overestimate the significance of impacts at the species level. A more reasonable and meaningful approach, and one more likely to be consistent with agency wildlife policy, would have been to estimate habitat loss for individual species based on the species' known range and distribution.

In order to conduct proper and sufficient analysis of the impacts to wildlife, to remedy the deficiencies of the draft PEIS, and to provide for improved conditions for sensitive species, additional future analyses must consider:

- Program and project level impacts to "the occurrence, distribution, population, and habitat condition of all ESA-listed species" on lands potentially impacted by solar development as well as assess the significance of lands potentially impacted by solar development in the conservation of ESA-listed species.840.1E4.
- Whether solar development actions (including mitigation actions) will improve the status of special status species so that their Bureau sensitive recognition is no longer warranted.
- Whether solar development actions will contribute to "a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range." Following this standard would ensure that the program does not increase the risk of adding a species to the sensitive species list.
- The potential for harm to "species (which depend) on ecological refugia or specialized or unique habitats on BLM-administered lands" and whether potential solar development could lead to "alteration such that the continued viability of the species in that area would be at risk." 6840.2A1. Following this standard would ensure that the program does not increase the risk of adding a species to the sensitive species list.
- Potential impacts to "the distribution, abundance, population condition…and habitat needs for sensitive species" and sufficiently evaluate the potential impacts of solar development actions on lands in conserving those species. 6840.2C1.
  Whether species management objectives are being met as part of mitigation and adaptive management plans the "monitoring (of) populations and habitats of Bureau sensitive species." 6840.2C3.

Recommendations: BLM should conduct a meaningful vulnerability analysis of the effects of habitat fragmentation, alteration and degradation on populations of special status species that includes all potentially affected species, is based on meaningful biological and spatial scales, and focuses at the population level. Such analysis is required in order for BLM to be in compliance with its own policy.

2. The Solar Energy Program must define and employ measurable wildlife standards that are consistent with agency wildlife policy.

The PEIS relies on mitigation measures to alleviate harm to wildlife and special status species, however, it does not adequately describe how the Solar Energy Program will "minimize or eliminate threats" to sensitive species, nor how it will evaluate "the significance of …actions undertaken by the BLM in conserving those species" to an extent that satisfies the SSS policy.

The underlying problem is that the PEIS fails to establish an explicit standard that can be used to determine what level of impacts to sensitive species is deemed acceptable and how much mitigation is required. Without this standard, the analysis in the PEIS of avoidance, minimization, and mitigation occurs in a vacuum.

One manifestation of this problem occurs in Appendix M, page 34, which states that if a project cannot be sited to avoid occupied habitats, then translocation and compensatory mitigation will be "recommended for consideration," with the final mitigation plan being determined at the project level. This language provides no information on exactly when translocation and compensatory mitigation should be implemented, largely because it is unclear when these measures are actually needed. If the PEIS were to establish a quantitative, risk-based standard that defines the maximum extent that a sensitive species could be endangered as a result of the Solar Program, then it would be clearer when mitigation is and is not required. This would not only provide the environmental community with greater certainty, but also enable solar developers to more effectively site and plan development projects.

In addition, it is not clear whether the proposed mitigation measures introduced under 5.10.5 will achieve wildlife policy objectives. For example, "projects shall be sited and designed to avoid direct and indirect impacts on important, sensitive, or unique habitats in the project vicinity, including, but not limited to….habitats supporting special status species *populations*…For cases in which impacts cannot be avoided they shall be minimized and mitigated appropriately." DPEIS, p. 5-127. The language fails to define habitats which support special status species populations, nor to articulate what standard shall apply to appropriate minimization and mitigation using a population level effect. The section goes on to say that projects "should not be sited in…other specially designated areas that are considered necessary for special status species and habitat conservation." Again, determinations of what is "necessary" for species conservation are not clearly articulated in biologically meaningful terms.

The PEIS repeats this failure to properly account for populations of special status species in the program design features, including:

- The final PEIS fails to clearly define the relationship between the protection of "potentially sensitive resources" including "unique biological communities" and "crucial wildlife habitats" and actual populations of wildlife and special status species as directed by agency policy.
- The Draft PEIS states: "Buffer zones shall be established around sensitive habitats, and project facilities and activities shall be excluded or modified within those areas." The final PEIS must describe how buffer zones will be established around "sensitive habitats" (and explain why "unique" and "important" habitats are excluded from this requirement) and describe how determinations will be made whether to exclude or modify activities. It is unclear in the Draft PEIS whether the buffer zones themselves will be "substantiated by best available information or science" or whether this applies to the modifications.
- The final PEIS or subsequent analyses must clarify the degree to which "habitat loss, habitat fragmentation, and resulting edge habitat due to project development shall be minimized." Similarly, the Final PEIS must clarify and define how projects will be

designed "to minimize the disruption of animal movement patterns and connectivity of habitats."

Recommendation: The BLM must establish an explicit standard that can be used to determine what level of impacts to sensitive species is deemed acceptable and how much mitigation is required to achieve species conservation.

D. ***National Historic Preservation Act***

Several 2010 fast track projects in California are currently in litigation in alleged violation of cultural and historic resources law over issues such as failure to avoid culturally important locations, failure to adequately consult with tribes, and inadequate analysis of cultural and historic resources. Anecdotally, critics have charged that the BLM's cultural resource evaluations appear to be an afterthought rather than fully integrated into project design and evaluation.

Ideally, cultural and historic evaluation, and government-to-government outreach to tribes, would be started well in advance of specific project design in order to avoid important resources. The following comments are offered in recognition that cultural and historic resources must be addressed as carefully as environmental resources, engaging all key stakeholders, and ensuring that laws governing them are fully followed. If they are not, these mistakes can doom an otherwise well-sited renewable energy project.

Section 106 of the National Historic Preservation Act (NHPA) includes a process for early identification of cultural resources and Traditional Cultural Properties or sacred areas in and adjacent to the SEZs as defined in the Draft PEIS.[31] Currently, a lack of inventory, site information, and quality consultation of interested Native American Tribes prevents a reliable idea of quality, number and location of significant cultural resources and sacred areas that may significantly hamper completion of proposed renewable energy projects.

The PEIS should clearly state that the ROD on the Final PEIS does not preclude or substitute for the continuing process of consultation with parties in order to comply with Section 106 of the National Historic Preservation Act during subsequent project specific EIS determinations, and that requirements to meet applicable parts of Section 106 have not yet been fulfilled.

These Section 106 requirements include but are not limited to cultural resources that meet the eligibility criteria for listing on the National Register of Historic Places (NRHP), are considered "significant" resources, and must be taken into consideration during the planning of federal projects. Federal agencies are also required to consider the effects of their actions on sites, areas, and other resources (e.g., plants) that are of religious significance to Native Americans as

[31] Information for this section was drawn primarily from PATRICIA L. PARKER *and* THOMAS F. KING (1990; Revised), Guidelines for Evaluating and Documenting Traditional Cultural Properties, *Cultural Anthropologist and Archeologist, American Indian Liaison Office, National Park Service Senior Archeologist and Director of the Office of Program Review, Advisory Council on Historic Preservation (formerly)Consultant, Archeology and Historic Preservation (currently).* U.S. Department Of The Interior, National Park Service, National Register, History And Education, National Register Of Historic Places

established under the American Indian Religious Freedom Act (P.L. 95-341). Native American graves and burial grounds are protected by the Native American Graves Protection and Repatriation Act (P.L. 101-601). Many of these resources are found in the six-state area covered by the PEIS.

1. Legal framework for managing cultural resources

The NHPA is the overarching law concerning the management of cultural resources. Numerous other regulatory requirements, however, pertain to cultural properties and are presented below. These laws are applicable to any project undertaken on federal land or requiring federal permitting or funding.

The NHPA created the framework within which cultural resources are managed in the United States. Section 106 of the NHPA defines the process for the identification of a cultural resource and the process for determining if a project will adversely affect the resource. The NHPA establishes the processes for consultation among interested parties, the agency conducting the undertaking, and the relevant State Historic Preservation Office (SHPO) or Tribal Historic Preservation Office (THPO); and for government-to-government consultation between U.S. government agencies and Native American Tribal governments. The NHPA, in Section 106, also addresses the appropriate process for mitigating adverse effects. The NHPA applies to federal undertakings and undertakings that are federally permitted or funded. The Solar PEIS is an undertaking subject to the NHPA.

Cultural resources on BLM-administered land are managed primarily through the application of the above identified laws. Guidance on the application of the laws is provided through Programmatic Agreements (PAs) developed among the BLM, the National Council of SHPOs, and the Advisory Council on Historic Preservation; and through state-specific PAs concerning cultural resources. Further guidance is provided through the 8100 Series manuals and handbooks for BLM employees, which outline cultural resource management on BLM-administered land.

"Significant Cultural Resources" which are protected by NHPA are generally 50 years of age or older and meet National Register of Historic Places (NRHP) criteria for evaluation (36 Code of Federal Regulations 60.4) which state, in part:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, materials, workmanship, feeling, and association, and
>
> Criterion A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> Criterion B. that are associated with the lives of persons significant in our past; or
>
> Criterion C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high

> artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> Criterion D. that have yielded, or may be likely to yield, information important in prehistory or history.

While historic period sites may be determined NRHP eligible under virtually any of these criteria, prehistoric archaeological sites are almost always evaluated with respect to Criterion D. In other words, to be considered NRHP eligible, a prehistoric site must have yielded, or have the potential to yield

> important information about some aspect of prehistory or history, including events, processes, institutions, design, construction, settlement, migration, ideals, beliefs, lifeways, and other facets of the development or maintenance of cultural systems. . . . Any consideration of a property's eligibility under Criterion D must address (1) whether the property has information to contribute to our understanding of history or prehistory and (2) whether that information is important.

An eligible property must also be at least 50 years old (with a few special exceptions) and retain a certain amount of physical integrity.

2. Recommendations for managing cultural resources

Cultural resources information on public lands in and near the proposed Solar Energy Zones is incomplete. Coupled with the lack of inventories in and surrounding most of the SEZs, this means that early identification of areas appropriate for development cannot be completed with any assurance of reliability. In fact, Table 1 below illustrates the percentage of inventory within each SEZ. Sixteen of the SEZs have less than 5 percent surveyed and seven of these have less than 1 percent completed. No totals were given for seven of the SEZ. However, descriptions suggest that five have low percentages inventoried. In only one SEZ, Dry Lake near Las Vegas, NV, have surveys been completed to any appreciable amount.

We are recommending a two-phased approach to increase the quality and amount of data in a relatively cost effective and timely manner. The first is to develop a predictive model using existing data from surrounding areas within the same physiographic and cultural areas. The model should allow the agency to better extrapolate what kinds, location, and quality of sites will likely occur in the SEZs in areas that are to be inventoried. The second part includes completing a sample survey to bring the percentage of the inventory up. This will help the agency with selection and boundary adjustments before the PEIS is completed. As part of this sample survey, the agency should conduct viewshed analyses for proposed SEZs to identify which historic properties located outside SEZs—such as national scenic and historic trails and TCPs—whose significances are at least partly tied to their settings, could be adversely affected by development within the SEZs. Using these approaches, the agency will be more likely to predict issues that may arise during the required Section 106 compliance. This will also assist developers to avoid areas that are likely to contain significant cultural resources and the subsequent costs of data recovery or project adjustment.

Table 1. Acreage and percentage of inventory by SEZ.

SEZ	State	SEZ Acreage	Approx. % Surveyed	Comments
Brenda	AZ	3,878	0	
Bullard Wash	AZ	7,239	0	
Gillespie	AZ	2,618	?	4 linear, 1 block
Imperial East	CA	5,722	?	1 block partially in NW
Iron Mountain	CA	106,522	?	at least 3 linear surveys
Pisgah	CA	23,950	?	at least 19 surveys
Riverside East	CA	202,896	?	at least 109 surveys
De Tilla Gulch	CO	1,522	3.8	
Fourmile East	CO	3,882	0	
Los Mogotes East	CO	5,918	0.2	
Antonito SE	CO	9,729	0	
Afton	NM	77,623	8	
Mason Draw	NM	12,909	2	
Red Sands	NM	22,520	7	
Amargosa Valley	NV	31,625	3	
Delamar Valley	NV	16,552	3.4	
Dry Lake	NV	15,649	60.2	
Dry Lake Valley North	NV	76,874	2.8	
East Mormon Mountain	NV	8,968	0.9	
Gold Point	NV	4,810	0	
Millers	NV	16,787	4	
Escalante Valley	UT	6,614	?	8 linear; 2 block partially in S & W
Milford Flats South	UT	6,480	?	9 mostly linear
Wah Wah Valley	UT	6,097	0.04	

a. Native American Consultation

One kind of cultural significance a property may possess, and that may make it eligible for inclusion in the Register, is *traditional cultural significance*. National Register Bulletin 2009. "Traditional" in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. The traditional cultural significance of a historic property, then, is significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices. Examples of properties possessing such significance include:

- a location associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world;

- a rural community whose organization, buildings and structures, or patterns of land use reflect the cultural traditions valued by its long-term residents;

- an urban neighborhood that is the traditional home of a particular cultural group, and that reflects its beliefs and practices;

- a location where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice; and

- a location where a community has traditionally carried out economic, artistic, or other cultural practices important in maintaining its historic identity. A traditional cultural property, then, can be defined generally as one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community.

b. Recommendations to Address Native American Concerns

Native American consultation under Section 106 of the National Historic Preservation Act must be conducted on all federal undertakings that may have an effect on sites or areas that may be of concern. Not only is there a legal mandate to complete consultation, but it is the right thing to do and is part of good management planning. This consultation should be:

- Meaningful -- the agency must make a reasonable and good faith effort to identify consulting parties;
- The consultation must fully address tribes' concerns;
- Government to government consultation must be conducted in person and should be ongoing until parties resolve adverse affects;
- Government to government is in addition to the regular public process dictated by NEPA;
- Consultation should consider cumulative effect of this project and others on traditional properties, cultural resources and tribal concerns; and
- Consultation should consider not only direct effects, but indirect effects on traditional properties.

To be most successful, consultation should be undertaken in the earliest stages of project development—meaning before scoping for NEPA—to avoid costly expenditures on locations that are inappropriate for development because of cultural or historic resources.

Recommendations: As written, the Draft PEIS does not fulfill BLM's obligations under the NHPA. In order to comply with both the requirements and intent of the NHPA and other obligations for consultation, the Modified SEZ Program Alternative must set out more specific requirements and commitments for inventory and consultation, as described above.

E. Federal Land Policy and Management Act

1. Multiple use management requires consideration of other resources when defining a solar energy program.

The Federal Land Policy and Management Act, ("FLPMA"), 43 U.S.C. § 1701 et seq., provides the BLM with both the obligations and the discretion to design a solar energy development program that also achieves meaningful conservation objectives, pursuant to its mandate of managing the public lands for "multiple use" and "sustained yield."[32] *See Theodore Roosevelt Conservation P'ship v. Salazar*, 616 F.3d 497, 518 (D.C. Cir. 2010) (observing that FLPMA affords the agency broad "discretion to decide how to achieve the multiple use and sustained yield objectives."). "Multiple use management' is a deceptively simple term that describes the enormously complicated task of striking a balance among the many competing uses to which land can be put, "including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and [uses serving] natural scenic, scientific and historical values." *Norton v. S. Utah Wilderness Alliance*, 542 U.S. 55, 58 (2004)(citing 43 U.S.C. § 1702(c)).

The definition of multiple use specifically provides for the agency to manage some areas for certain uses and certain resources:

> **The term "multiple use"** means the management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; **making the most judicious use of the land for some or all of these resources or related services** over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; **the use of some land for less than all of the resources**; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and non-renewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.

42 U.S. C. § 1702(c) (emphasis added).

FLPMA provides equal standing to the many uses and values of the public lands, such as fish and wildlife and wilderness characteristics. One of the Act's enumerated purposes is that:

[32] "Multiple use" is defined as managing the lands so that the various resources, "recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values," are utilized in the combination that will best meet the present and future needs," of the public. 43 U.S.C. § 1702(c). "Sustained yield" is defined as managing to maintain regular renewable resource outputs in perpetuity. 43 U.S.C. § 1702(h).

> the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use. . .

43 U.S.C. § 1701(a)(8). BLM's discretionary multiple use mandate provides the agency with the flexibility to design a solar development program that both achieves solar energy production goals and conserves ecological resources.

2. BLM must ensure that management decisions are based on a current inventory of the resources of the public lands.

FLPMA imposes a duty on BLM to identify and protect the many natural resources found on public lands. FLPMA requires BLM to inventory its lands and their resources and values, "including outdoor recreation and scenic values." 43 U.S.C. § 1711(a). FLPMA also obligates BLM to take this inventory into account when preparing land use plans, using and observing the principles of multiple use and sustained yield. *See* 43 U.S.C. § 1712(c)(4), (1). Through management plans, BLM can and should protect wildlife, scenic values, recreation opportunities, and wilderness character in the public lands through various management decisions, including by excluding or limiting certain uses of the public lands. *See* 43 U.S.C. § 1712(e). However, these decisions must be based on current knowledge of resources. FLPMA's inventory requirements buttress NEPA's requirements for an accurate depiction of the affected environment, directing the BLM to make management decisions, such as designating lands for utility-scale solar energy development, based on a sufficient knowledge of the other resources likely to be affected.

3. FLPMA requires the BLM to avoid environmental damage and degradation.

In issuing rights-of-way, FLPMA requires BLM to impose terms that will "minimize damage to scenic and esthetic values and fish and wildlife habitat and otherwise protect the environment" 43 U.S.C. § 1765(a)(ii). "[U]nderscoring the BLM's duty to protect the environment is the statutory requirement that 'in managing the public lands the Secretary shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands." *Utah Shared Access Alliance v. Carpenter*, 463 F.3d 1125, 1129 (10th Cir. 2006). The D.C. district court in *Mineral Policy Center v. Norton* held that this standard, "by its plain terms, vests the Secretary of the Interior with the authority – and indeed the obligation – to disapprove of an otherwise permissible mining operation because the operation, though necessary for mining, would unduly harm or degrade the public land." *Mineral Policy Center v. Norton*, 292 F. Supp. 2d 30, 35 (D.D.C. 2003). Under *Mineral Policy Center*, BLM has the obligation to prevent degradation that is "undue or excessive." *Id.* at 38. Further, BLM's duty to prevent unnecessary or undue degradation under FLPMA is mandatory, and BLM must, at a minimum, demonstrate compliance with this standard. *See Sierra Club v. Hodel*, 848 F.2d 1068, 1075 (10th Cir. 1988) (the "unnecessary or undue degradation" standard provides the "law to apply" and "imposes a definite standard on the BLM").

Through the Solar PEIS, BLM is going to make lands available for development on a colossal scale: the establishment of SEZs on 677,400 acres assumed to experience an 80% build-out with another 21 million acres of public lands available for solar development.[33] Solar development will have serious consequences for wildlife and other resources. For example, the Draft PEIS observes that "[n]umerous wildlife species would be adversely impacted by loss of habitat, disturbance, loss of food and prey species, loss of breeding areas, effects on movement and migration, introduction of new species, habitat fragmentation, and changes in water availability." DPEIS, p. 6-9. The scale of proposed utility-scale solar development and its impacts may, without further commitments of analysis and mitigation prior to authorizing projects (and in light of the deficiencies noted in this comment letter), result in undue degradation to the public lands, including special status species and their habitat. FLPMA's direction also supports NEPA's requirement to consider more environmentally protective management alternatives.

Recommendations: FLPMA requires the BLM to ensure that due consideration is given to management actions that will protect the many resources of our public lands (including fish and wildlife habitat and wilderness characteristics), and provides additional obligations and authority to determine the conditions of these resources. By designing a solar energy development program that aspires to and achieves both development and conservation objectives, the BLM will truly fulfill its multiple use mandate under FLPMA for these public lands.

F. Endangered Species Act

1. BLM Should Take Advantage of Several Opportunities to Streamline Section 7 Consultations Within the Solar Energy Zones

To encourage solar energy development within SEZs, BLM should take advantage of several opportunities to streamline section 7 consultations within the zones. The first opportunity is gathering enough data to begin formal consultations as early as possible within the zones. The Service's Section 7 Handbook clarifies that "formal consultation, if required, should be initiated prior to or at the time of release of the [Draft EIS]" and that "at the time the Final EIS is issued, section 7 consultation should be completed."[34] To date, BLM has not begun formal consultation on its new Solar Energy Program.

The second is for BLM and USFWS to consider conducting an appended programmatic consultation for each SEZ. This would allow USFWS to issue a programmatic biological opinion and incidental take statement for one or more zones, based on design features and other requirements of the Solar Energy Program. When BLM reviews projects under the program, it can append the project-specific documents to the programmatic biological opinion, thus completing the consultation process for projects with sufficiently low impacts to listed species.

[33]We want to emphasize that, while assuming an 80% buildout may be reasonable for purposes of assessing the maximum environmental impacts of the proposed program, it is just that – an assumption. Whether an individual SEZ and its resources can accommodate that level of development must depend on analyses of the sort that BLM has yet to prepare, either in this PEIS or the individual project-specific EISs it has prepared to date. In fact, BLM staff as well as others are already concerned about the level of development that has been permitted in California's Riverside East proposed SEZ, which is far less than 80% of that zone's total acreage.

[34] U.S. Fish & Wildlife Service and National Marine Fisheries Service, *Endangered Species Consultation Handbook*, March 1998, pg. 4-11.

This appended approach would streamline consultations even more than a tiered programmatic consultation would, as the latter requires a biological opinion for each project.[35]

Third is to prioritize development in zones that have the lowest potential for conflicts with the conservation of threatened and endangered species. The Draft PEIS has already identified which listed species occur within each zone, and we have tallied this information in the table below. Incentivizing solar development in zones with low potential conflict would result in greater net conservation benefits and greater regulatory certainty for developers.

Table 2. Number of Sensitive Species by Proposed Solar Energy Zone

	ESA Endangered	ESA Threatened	ESA Under Review	ESA Candidate	ESA Proposed Threatened
Arizona					
Brenda (Lake Havasu/La Paz)	0	1	1	0	0
Bullard Wash (Hassayampa/Yavapai)	4	1	1	0	0
Gillespie (Lower Sonoran/Maricopa)	2	1	1	2	0
California					
Imperial East (El Centro/Imperial)	1	0	0	0	1
Iron Mountain (Needles/San Bernardino)	0	1	0	0	0
Pisgah (Barstow/ San Bernardino)	1	1	0	0	0
Riverside East (Palm Springs–South Coast/Riverside)	0	1	0	0	0
Colorado					
Antonito Southeast (La Jara/Conejos)	1	0	1	1	0
De Tilla Gulch (Saguache/Saguache)	1	0	1	1	0
Fourmile East (La Jara/Alamosa)	1	0	0	1	0
Los Mogotes East (La Jara/Conejos)	1	0	1	1	0
Nevada					
Amargosa Valley (Southern Nevada/Nye)	5	7	16	0	0
Delamar Valley (Ely/Lincoln)	4	1	5	1	0
Dry Lake (Southern Nevada/Clark)	3	1	6	1	0

[35] Appended consultations have been used in other situations involving programmatic agency actions.

Dry Lake Valley North (Ely/Lincoln)	0	1	0	0	0
East Mormon Mountain (Ely/Lincoln)	0	1	0	1	0
Gold Point (Battle Mountain/Esmeralda)	0	0	0	1	0
Millers (Battle Mountain/Esmeralda)	0	0	2	1	0
New Mexico					
Afton (Las Cruces/Dona Ana)	2	0	0	1	0
Mason Draw (Las Cruces/Dona Ana)	2	0	0	0	0
Red Sands (Las Cruces/Otero)	4	0	0	0	0
Utah					
Escalante Valley (Cedar City/Iron)	0	1	0	1	0
Milford Flats South (Cedar City/Beaver)	0	1	0	1	0
Wah Wah Valley (Cedar City/Beaver)	0	1	3	1	0

Recommendation: The BLM should: 1)gather enough data to begin formal consultations as early as possible within the zones; 2) consider jointly with USFWS whether to conduct an appended programmatic consultation for each SEZ; and 3) prioritize development in zones that have the lowest potential for conflicts with the conservation of threatened and endangered species.

2. BLM Should Implement its Section 7(a)(1) Obligations by Setting a "Net Conservation Benefit" Standard for ESA Listed Species

Under the ESA, BLM is required not only to consult under section 7(a)(2) on the impacts to listed species, but also affirmatively conserve these species under section 7(a)(1).[36] BLM can implement its section 7(a)(1) obligations by establishing a "net conservation benefit" standard for ESA listed species through the Solar Energy Program. As discussed in other parts of our comments, this standard would require a project that adversely impacts a listed species to successfully enhance that species' overall population or recovery status. To be classified as a net conservation benefit, the enhancement must benefit the affected species to a greater degree than if the project were not undertaken. Because BLM policy already requires developers to implement mitigation measures for impacted species, the framework for achieving a net benefit standard already exists.

[36] Federal agencies shall "seek to conserve [listed] species and shall utilize their authorities in furtherance of the purposes of [the] Act." 16 U.S.C. § 1536(a)(1).

Section 7(a)(1) is designed to ensure that federal agencies "conserve" listed species, which means to recover a species to the point where it no longer requires the ESA's protection – in other words, result in a "net benefit." If the Solar Energy Program explicitly implements the section 7(a)(1) net benefit standard, then BLM and solar developers could showcase the program as an example of "green" development that is both climate friendly and wildlife friendly, and the BLM would be in compliance with its ESA obligation to conserve listed species Adopting a net benefit standard would also directly benefit developers by minimizing the risk of negative publicity and legal challenges over projects that may otherwise have questionable impacts to listed species. This would result in additional economic and regulatory certainty to the hundreds of projects expected to be approved under the Solar Energy Program.

Recommendation: The BLM should work with the USFWS to implement the Bureaus Section 7(a)(1) obligations by setting a net conservation benefit standard for all ESA listed species adversely impacted by the Solar Energy Program.

E. Bald and Golden Eagle Protection Act

Based on U.S. Fish and Wildlife Service's analysis of golden eagle populations across the nation, there is no safely allowable take level for golden eagles.[37] In other words, the status of the golden eagle is so dire that the U.S. Fish and Wildlife Service completely prohibits the taking of a golden eagle. The Bald and Golden Eagle Protection Act, 16 U.S.C. §§ 668 *et seq*., is intended to be the "primary vehicle" for the conservation and protection of golden eagles, *see* 71 Fed. Reg. 8265, 8266 (Feb. 16, 2006), and as such, makes it unlawful to "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or in any manner, any bald eagle [] alive or dead, or any part, nest, or egg thereof . . .." 16 U.S.C. § 668(a). Principal among the Act's protections, the prohibition against "take," by definition, makes it illegal to: "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or *disturb*" an eagle. 50 C.F.R. § 22.3 (2010) (emphasis added). Further, "disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." *Id*.

In California, for example, golden eagles are known to nest within a few miles of the Pisgah Valley. Development in the proposed Pisgah SEZ would constitute a "take" of golden eagles because it would disturb, and indeed destroy, the foraging habitat of nearby golden eagles. In addition, solar development within the Pisgah Valley would create the potential for golden eagles colliding with mirrors or PV panels while foraging.

Recommendation: In order to comply with the FWS regulations, BLM must ensure additional analysis is conducted within the Modified SEZ Program Alternative.

III. Make it smart

[37] Pagel, Joel, et. al, *Interim Golden Eagle Technical Guidance*, U.S. Fish and Wildlife Service, February, 2010.

The DPEIS proposes important elements of a comprehensive, enduring solar energy program that can responsibly protect sensitive wild lands and wildlife habitat. However, both of the "action alternatives" which are intended to "establish a comprehensive program to facilitate utility-scale solar energy development on BLM lands" (PEIS, 2-1) omit key elements necessary to meet the goals of the program. Section 1.I of this letter lays out our recommendations for a **Modified SEZ Program Alternative**. This section provides additional detail for how a Modified SEZ Program Alternative should be structured and function in practice.

A. ***BLM should expand and adopt Best Management Practices for solar energy development on public land.***

The draft solar PEIS devoted significant attention to best management practices. In addition to those BMPs already identified in the PEIS, we urge BLM to expand the BMPs as described below. Compliance with all applicable BMPs should be required for solar energy development on all public lands.

While the first, and best, strategy for conserving natural resources is to avoid sensitive areas, there will be significant surface disturbance and other adverse impacts wherever solar energy development occurs. Minimizing these impacts where possible is a critical element of a responsible development approach.

Experience with solar energy development is in its infancy in the U.S. As such, the literature on best management practices is quite sparse with regard to most utility-scale solar energy development technologies. However, there are many common features with other forms of commercial energy development. Best management practices identified from other forms of energy develop should be integrated into the **Modified SEZ Program Alternative** so that a Zone-Based Solar Energy Program can learn from past experience with, for example, road construction and decommissioning.

A compilation of best management practices for renewable energy siting and development drawn from scientific, peer-reviewed research, was recently prepared by Utah Clean Energy and several other conservation groups in the West, attached as Appendix VIII. We urge the BLM to carefully examine this document, and to take from it any and all practices not already included in the administrative polices and guidance. Moreover, we urge the BLM to commit to producing and updating a compendium of such practices.

B. ***Approach to mitigation.***

As is true with any project that could affect sensitive resources, agencies should seek first to find ways to avoid impacts entirely and then to minimize them through changes to the project design and configuration. In addition to avoidance and minimization efforts, compensatory mitigation must be required when there are impacts that cannot be avoided or sufficiently minimized –these impacts include the direct, indirect and cumulative effects described for wildlife, water and other resources in the draft PEIS.

In its treatment of compensatory mitigation measures, as discussed throughout our comments, the Draft PEIS fails 1) to provide necessary description of possible mitigation measures; 2) to establish mitigation goals; and 3) to analyze the sufficiency of mitigation requirements it does propose.

The draft PEIS fails to include a focused discussion about how compensatory mitigation will be carried out in such a way as to offset impacts on endangered, threatened, candidate and sensitive species. For example, while Chapter 5 (Impacts of Solar Energy Development and Potential Mitigation Measures) provides extensive discussion of avoidance and minimization measures, it neglects to mention compensatory mitigation. Each subsection of the chapter describes impacts which cannot be avoided, but proposes no compensatory mitigation measures. This is unacceptable when there are 400 rare, sensitive species, state- or federally-listed and/or candidate species identified as potentially facing effects in SEZs and 562 species potentially affected by BLM's preferred alternative.

BLM should describe its approach to compensatory mitigation in far more detail to give greater certainty to developers and to potential providers of mitigation services. We offer the following comments:

1. *Loss of federal lands and resources that provide habitat for threatened and endangered species and sensitive species should be successfully mitigated by the acquisition and permanent protection of currently non-federal lands and resources that provide better than equivalent benefits to wildlife.* BLM should place the highest priority on acquisition, restoration, and long-term management of private lands to mitigate remaining wildlife impacts that cannot be minimized. If newly protected lands are to be held in non-federal ownership, conservation values must be given similar permanent protection through deed restrictions and easements, and funding must be secured for long-term management of these lands. We believe the final PEIS should establish *a preference* for acquisition, restoration and management of private lands versus allocation of mitigation dollars to federal lands, while recognizing that in many cases it will be necessary to pursue mitigation measures on federal lands as well. In some locations such as Nevada, there is inadequate private land available for acquisition so the only possible mitigation is restoration, enhancement and permanent protective management of public lands.

2. *On federal mitigation lands, permanently protect conservation values.* If lands acquired for mitigation purposes are to be transferred to federal ownership, they must be protected from future development. One option by which to do so is to withdraw these lands from use under federal mining and other land use laws and cover them by a plan amendment that ensures long-term protection of their conservation values. This option, however, cannot guarantee protection in perpetuity, upon which the mitigation is based, since new plan amendments can alter the land management. Our preferred option is to require that third parties secure easements or enforcement rights through deed restrictions before property is transferred to federal ownership. In either case, this additional protection is necessary because federal lands face extraordinary energy development and other pressures, and mitigation efforts will fail if an acre protected

today, in compensation for a loss elsewhere, is developed and made unsuitable to wildlife through some future project or authorized activity. Future mining, energy development, grazing and other non-compatible uses need to be prohibited using legally effective means (e.g. deed restrictions with enforcement rights held by third parties).

To the extent that mitigation occurs on public lands, BLM must take measures to ensure it is not offering mitigation at below-market costs compared to mitigation options on private lands and that it is not simply using private funding to pay for activities which it (or other agencies) already has an obligation and duty to carry out. In particular for endangered species, federal agencies have special duties under the Endangered Species Act to affirmatively use their authorities to promote endangered species conservation (see http://www.edf.org/documents/1667_michael%20bean%20testimony.pdf). To prevent the public from essentially subsidizing the costs of mitigation, BLM needs to ensure that private funding does not simply substitute for public funding for land management activities on a parcel now being used to mitigate solar impacts.

3. *On federal and non-federal mitigation lands, require endowments to ensure the perpetual management of mitigation lands.* The protection of land hosting affected wildlife populations or the restoration of such lands to better support wildlife will mitigate impacts only for as long as the wildlife populations endure. The final PEIS should be used to establish guidance on the establishment and transparent operation of regional or other large-scale endowments to maintain mitigation values over time. An established mitigation lands endowment program between the California Department of Fish and Game and the National Fish and Wildlife Foundation is a good model for what is needed under this PEIS. These funds should be set up to serve one or multiple solar development zones. This premise of establishing a perpetual management endowment is well established in federal conservation banking policy and in some state law and policies. It would be inappropriate for BLM to hold private land projects needing Section 10 permits to a higher mitigation standard than for those projects occurring on public lands. We do not believe that such mitigation funds, whether maintained for the management of public or non-public lands, should be held by a federal entity.

4. *Land acquisition is inadequate to meet a 'no net loss' or 'net conservation benefit' goal and must be supplemented with species restoration and management activities and funding.* Land acquisition, by itself may not satisfy a net conservation benefit standard for particular species because it may simply result in the protection of a wildlife resource that is already present or may fail to address current critical stressors affecting the wildlife resource. We believe most mitigation projects should include a significant commitment to restoration and long-term management, allocating mitigation dollars to actions that significantly enhance sensitive, threatened and endangered wildlife and plant populations. Such projects create a positive change in populations that can help offset direct and incidental losses of individuals and local populations on solar development sites. Establishing a priority on management and

restorationthrough this PEIS will also creates a clear signal which would incentivize the creation of private banks to secure and begin implementing such restoration in advance of actual mitigation plans being established for future projects. Permanent retirement of grazing permits should be included among activities that could result in restoration of habitat for affected wildlife.

5. *Improve certainty for developers and improve wildlife benefits by creating expansive service areas for mitigation, pooling mitigation funds and using a transparent and competitive process to allocate resources to affected species conservation efforts* Project-by-project development of mitigation formulas and identification of mitigation projects is a wasteful system whose flaws have already been documented in case studies of wetland mitigation and endangered species banking. This process also creates higher costs and lower certainty for companies. The final PEIS should include explicit discussion of how mitigation efforts will be coordinated within a large 'service areas' for all designated Solar Energy Zones and should discuss available and preferred options for mitigation within these service areas. Large zones will create more opportunity for mitigation efforts to be directed to the highest value lands and habitats where activities will most benefit affected species. California and the U.S. Fish and Wildlife Service's habitat conservation plan policy, regional conservation strategies developed by state fish and wildlife departments, and the best habitat banking practices all serve as models to establish effective service areas for mitigation that will maximize benefit for affected species. Ideally, the final PEIS would include maps that identify potential priority areas that have the wildlife resources to serve as mitigation lands.

   A coordinated and transparent approach that prioritizes the allocation of funds to species and types of projects and then seeks the highest benefit/least cost solution to secure benefits will provide greater recovery benefits to sensitive, endangered and threatened species. The final PEIS should also identify species priorities for land and water acquisition for wildlife and plants that BLM already knows are likely to be affected by planned solar projects. Such an approach will create the certainty to allow more parties to develop mitigation options in advance before mitigation is needed. For reasons described above, we support a transparent and competitive process for selecting mitigation projects to ensure that private land restoration and protection is prioritized over work on federal lands, which agencies already have an ESA obligation to proactively manage. Investments should be in priority conservation areas as determined by state wildlife action plans, regional conservation strategies, recovery plans, Nature Conservancy ecoregional assessments, or other credible analysis or plans that identify the areas of greatest ecological significance, and at a meaningful scale.

Recommendations: BLM should enhance its approach to mitigation as well as its treatment of this key issue in the PEIS. First, the agency should describe its approach to compensatory mitigation in far more detail. Additionally, within its mitigation regime for solar energy development, BLM should establish a preference for land acquisition and restoration so as to better manage federal and private resources. Lands reserved for mitigation purposes, whether

private or federal, must be perpetually managed for conservation, and BLM should establish guidance as to how this can occur. Certainty for developers can be enhanced by establishing large "service areas" for mitigation.

C. ***Approach to monitoring.***

DOI agencies have too often failed to establish clear and measurable biological goals in their own work and in requirements of third parties seeking agency approval. The absence of goals feeds into problems with inadequate monitoring. The result is that too many projects fail to adequately compensate for impacts and DOI agencies have a poor record of being able to track such performance.

The DPEIS lacks assurances that implementation and effectiveness of mitigation measures will be monitored. CEQ recommends that all agency NEPA analyses and/or decision documents should:

- describe the expertise applied in determining appropriate mitigation commitments;
- consider when and how mitigation commitments will be implemented;
- specify measurable performance standards or expected results of mitigation commitments as well as the timeframe for the agency action and mitigation commitments;
- disclose if it is reasonably foreseeable that funding for mitigation measures may not be available and, if so, the resultant environmental effects;
- identify alternative mitigation measures if the initial commitments are not implemented or effective; and
- describe monitoring plans and programs, the agency and/or applicant responsible for developing and implementing the monitoring program and the monitoring area and appropriate monitoring system.

See Final Guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact, 76 Fed. Reg. 3843 (Jan. 21, 2011). BLM should use these recommendations as the basis for monitoring requirements established as part of the Modified SEZ Program Alternative established by the ROD.

To do this, BLM must use the final PEIS to define the types of outcomes (population size, viability, reproductive performance, age class distribution, etc.) that it will require. Additional final PEIS analysis should describe the expected results of mitigation and how it will serve to guide any monitoring program that BLM and applicants implement. "Monitoring is fundamental for ensuring the implementation and effectiveness of mitigation commitments, meeting legal and permitting requirements, and identifying trends and possible means for improvement." 76 Fed. Reg. at 3849. BLM must establish clear requirements for monitoring and reporting – to the public and the agency – on the success in achieving those goals. The monitoring program should also provide for public involvement. 76 Fed. Reg. at 3851.

Additionally, to evaluate the cumulative impacts on species and other resources, and to compare impacts of different solar projects, locations and technologies, the BLM should require

standardized monitoring protocols for all projects, including transmission and related substations. All monitoring data should be made publicly available in data sets with a common format (recommended by leading scientists who want to conduct studies) that may be easily downloaded and manipulated by researchers and the public at large. This transparency will enable timely and robust evaluation of program impacts, efficacy of mitigation measures, and full engagement of the scientific community.

Recommendations: BLM should establish clear requirements for monitoring and reporting to both the agency and the public at-large. Such requirements must enable third-party tracking of the effectiveness of mitigation measures and, as such, should involve the public in development.

D. Adaptive management.

The solar draft PEIS contains a number of references to using adaptive management. As an overall implementation strategy, the draft states that:

> *The BLM, recognizing that data regarding the actual impacts of solar energy development on various resources are still limited, will require the development and implementation of an adaptive management plan to ensure that new data and lessons learned about the impacts of solar energy projects will be reviewed and, as appropriate, incorporated into the Solar Energy Program.*

DPEIS, p. A-25. The DPEIS specifies at page C-12 that this requirement would apply to all lands available for solar development under either alternative. The Preferred Alternative specifically relies on adaptive management at the programmatic level:

> *As an element of the proposed program, the BLM would implement an adaptive management plan for solar energy development, developed in coordination with potentially affected natural resource management agencies, to ensure that new data and lessons learned about the impacts of solar energy projects would be reviewed and, as appropriate, incorporated into the program through revised policies and design features.*

DPEIS, p. ES-11. Additional detail is provided in Chapter 6 regarding the BLM's understanding of how an adaptive management plan would function:

> *As described in Section 2.2.2.1, as an element of the proposed program, the BLM would implement an adaptive management plan for solar energy development developed in coordination with potentially affected natural resource management agencies, to ensure that new data and lessons learned about the impacts of solar energy projects would be reviewed and, as appropriate, incorporated into the program through revised policies and design features. Changes to the BLM's Solar Energy Program will be subject to appropriate environmental analysis and land use planning.*

DPEIS, p. 6-31. The Preferred Alternative rests on incorporation of future data and knowledge into an adaptive management framework:

> *Proposed adaptive management strategies would ensure that new data and lessons learned about the impacts of solar energy development are incorporated into future programmatic and project-specific requirements.*

DPEIS, p. 6-35. In addition, the DPEIS states that:

> Monitoring program requirements, including adaptive strategies, shall be established at the project level *to ensure that potential adverse impacts are mitigated*. Monitoring programs shall consider the monitoring requirements for each ecological resource present at the project site, *establish metrics* against which monitoring observations can be measured, identify potential mitigation measures, and establish protocols for incorporating monitoring observations and additional mitigation measures into standard operating procedures.

DPEIS, p. 5-136. For all the reliance on an adaptive management approach to administering a solar energy development program, however, **there is no specific discussion of how an adaptive management approach would be implemented at the project or program level**.

We support the overall approach to adaptive management and, in general, the overall approach to adaptive management as described in the Draft PEIS. However, a fuller description of how adaptive management of the program would be carried out, such as specific indicators and acceptable levels of change, the commitment of resources for monitoring, and the use of a fallback prescription, and additional details regarding project-level actions that will be taken if levels of change are unacceptable need to be included and must be provided. This specificity is necessary in order for adaptive management to meet NEPA's standards for mitigation measures that are likely to be effective and enforced. Further, while adaptive management is described with regard to Integrated Vegetation Management (DPEIS, p. 5-131), Visual Resource Management (DPEIS, p. 5-201), and Decommissioning and Site Reclamation (DPEIS, p. 5-141), monitoring commitments and criteria should also be included for other key resources, such as BLM special status species, lands with wilderness characteristics, wild and scenic river segments and ACECs. Indicators can include the status of wilderness characteristics, outstanding river values, and the relevant and important values for which ACECs have been designated.

An example of sufficiently detailed adaptive management approach is contained in the Record of Decision for the Jack Morrow Hills Coordinated Activity Plan, prepared by the Rock Springs (WY) BLM Field Office. Appendix 2 (Implementation, Monitoring, and Evaluation Process) provides the specificity needed to evaluate the planned adaptive management program (and is available on line at http://www.blm.gov/style/medialib/blm/wy/jmhcap/rod.Par.37876.File.dat/02appendices.pdf). We particularly note the following, as examples of the sort of detail that should be contained in any and all adaptive management plans created pursuant to the Solar PEIS:

- Table A2-1 Resource Management Indicators - p. A2-7 – contains a broad set of indicators
- Table A2-2 Indicator Detail - pp. A2-8 – A2-10 – contains multiple sources for data
- Table A2-3 Measurement Detail - pp. A2-11 – A2-13 – contains measures of change and triggers for management actions

- Figure A2-2 CAP Management Process - p. A2-15 – provides a useful illustration of the adaptive management process

Recommendations: In addition to setting out a comprehensive set of measurements, triggers for action, and a range of actions that will be taken to meet the standards set out below, the PEIS must specify that:

- A sufficient inventory of current conditions of affected resources is required. Where the agency does not have a sufficient inventory of baseline conditions, the agency must complete such an inventory prior to using adaptive management.
- The adaptive management approach must incorporate a detailed monitoring plan, describe the resources and specific indicators that will be measured, include defined limits of acceptable change in resource conditions and specify actions to be taken if change reaches or exceeds those limits.
- The adaptive management process should be designed and managed so that the public can actively and effectively participate. This study area is very broad, involving hundreds of millions of acres across six states and citizens interested in the resources administered by the agency reside across those states as well as others; and, involvement of citizens in adaptive management processes can be challenging to interested parties. BLM should continue to seek meaningful citizen participation in compliance with its mandate under FLPMA. *See* 43 U.S.C. § 1739(e). BLM should also begin planning now as to how citizen involvement in adaptive management will meet the requirements of the Federal Advisory Committee Act, and such planning should not be left only to those citizens or community groups wishing to participate.

- To encourage robust science in adaptive management, we recommend that the Bureau actively seek involvement of the U.S. Fish and Wildlife Service and other federal and state wildlife experts as well as independent scientific community in both designing and implementing adaptive management programs.

- The adaptive management approach must include a "fallback" plan should monitoring or other aspects of the adaptive management process not be fully carried out, including adequate funding. Adaptive management must include requirements for when and how the proposed outcome will be reevaluated if it is not being met. The agency's ability to reevaluate or amend desired outcomes should not be the sole fallback if either the adaptive management process is not working or outcomes are not being met. The agency should be required to incorporate provisions to address situations based on new information, circumstances, regulatory requirements, or discontinued agency funding for monitoring that would trigger new NEPA.

E. The BLM should incorporate the elements of the Modified SEZ Program Alternative, including existing and proposed additional administrative policies and required Design Features in RMP amendments for all lands not excluded from solar energy development.

The BLM, through the final PEIS and its ROD on the new program, must ensure all existing guidance (e.g., IMs) *and* proposed elements that comprise the new Solar Energy Program are included in RMP amendments for lands not excluded from solar energy development. This will ensure consistency, establish baseline expectations for project proponents and other stakeholders, and minimize confusion about which guidance is in effect at any point in time.

Recommendation: The BLM should amend all RMPs where solar development is not excluded with a Modified SEZ Program Alternative, incorporating all existing IMs relating to solar energy development and included in the Draft Solar PEIS, Appendix A, in addition to the full range of proposed policy elements.

F. A Modified SEZ Program Alternative should pilot competitive offering of solar development rights to determine the most effective approach.

It is clear from historical experience with other energy resources on public lands that offering solar development rights competitively through a leasing process—versus offering parcels on a first-come-first-served basis—will provide the most fair return to the taxpayer.

This is because competitive leasing allows companies to determine the value of federal lands and resources for commercial electricity generation by way of the free market. This shifts the risk burden, at least to some degree, from the public to companies that will profit. In addition, all other energy programs, besides hydropower, have provisions to offer leases competitively if competitive interest exists. Coal, onshore and offshore oil and gas, offshore renewables, and geothermal energy parcels are may be offered competitively depending on the situation.

It is clear that competitive interest exists for solar energy development on public lands by the number of pending applications that overlap. In California, for example, more than half of the 35 applications within zones (i.e., 20) overlapped in whole or part the first-in-line applications as of March 7, 2011, based on the data currently available to us.[38] However, despite the precedents provided by other BLM energy programs, many questions remain about how a competitive system for solar resources might function. Therefore, in order to design the best competitive leasing program possible, BLM should commit to testing different mechanisms for competitive offerings in a Modified SEZ Program Alternative.

BLM can rely on existing authority to develop a pilot program for competitive leasing. IM 2007-097 provided that areas specifically identified in land use plans for "competitive leasing" in land use plans may be offered competitively. Guidance also states that the BLM can consider other factors like public interest and technology in deciding whether to offer lands for competitive leasing. However, BLM must clarify and enhance these provisions by offering a pilot competitive leasing program for solar development rights.

Recommendation: Through the Modified SEZ Program Alternative, BLM should establish pilot approaches to competitively offering solar energy development rights and select the system that best protects taxpayers interests and does not unduly or unnecessarily burden project proponents.

[38] The total first in line applications included three that were filed after June 30, 2009.

G. The Modified SEZ Program Alternative should revise the legal instrument used to administer solar energy development

BLM currently administers solar energy development utilizing a right-of-way use authorization as the instrument to convey development rights. The BLM asserts its intent to proceed via the ROW process in administering the new Solar Energy Program. Specifically, the PEIS references solar energy development as by definition a ROW authorized activity: "The BLM program would be applicable to all utility-scale solar energy technologies implemented under BLM jurisdiction in the six-state study area (i.e., projects implemented under a BLM-issued ROW authorization)." DPEIS, p. 2-2. That the BLM will proceed to administering solar energy development utilizing ROW authorization is never questioned in this document despite valid concerns that a lease is more appropriate to the nature and scale of this form of commercial energy development. In the final PEIS, BLM must demonstrate how a ROW grant is legally and programmatically preferable to a lease.

Moreover, the application form used for a solar energy right-of-way grant is a standard form (SF-299) is identical to that used for communication towers, irrigation ditches, temporary roads, and other more traditional ROW-governed development.

See Appendix II for a more thorough discussion of the relative advantages of leasing versus developing using a right-of-way.

Recommendation: The BLM should lease solar energy development rights.

H. A Modified SEZ Program Alternative should require that BLM wildlife policy be incorporated in Plans of Development.

The PEIS states that: "Applicants for solar energy development on BLM-administered lands shall develop a BLM-approved plan of development (POD) that incorporates…the requirements of other existing and relevant BLM mitigation guidance, approved land use plans, and current policies." DPEIS, p. A-30. The final PEIS should clarify how these requirements, including the requirements of agency wildlife policy (found at BLM Manual 6840 and 6500), will be incorporated into PODs and subsequent environmental review. See *Id*.

We commend the BLM for requiring that "management goals and objectives for special status species that the BLM has identified in land use plans" be incorporated into PODs. DPEIS, p. A-30. We recognize that management goals and objectives may vary in their effectiveness across RMPs, however, and therefore would recommend that PODs also be consistent with BLM wildlife policy.

Recommendation: The Modified SEZ Program Alternative should clarify the required content of PODs in order for them to effectively accomplish the goals the BLM claims they are designed to accomplish, including by incorporating key elements of the agency's wildlife policy. For example, the final EIS should clarify what is meant by species objectives that are sustained by the best available information or science.

I. A Modified SEZ Program Alternative must clarify the design features that require project facilities and activities to "not be located in or near occupied habitats of special status animal species."

This design feature is one of the most important features for protecting sensitive species, but should be clarified in two respects. First, there is no explanation of how the BLM will determine which habitats are "occupied." This must be done early in the process and in a way that is effective and consistent from project to project. Second, there is no explanation of why plants are excluded from this requirement.

Recommendation: The Modified SEZ Program Alternative should require that potentially occupied habitats be surveyed to confirm the presence or absence of sensitive species. The BLM should also ensure consistency in design features and explicitly include plants in this requirement.

J. The Modified SEZ Program Alternative should apply land exclusions to supporting infrastructure.

We support the PEIS's commitment to ensuring that the program will be implemented in accordance with approved land use plans, including ROW exclusion areas, but question why "the exclusions would only apply to siting of utility scale solar energy generation facilities and not to any required infrastructure" (including roads and transmission lines). DPEIS, p. 2-7. It would seem generally appropriate to apply exclusions to these elements as well, rather than relying on project specific environmental reviews to avoid conflicts and potential controversy.

The PEIS points out that many of the exclusions "refer back to decisions made in the approved land use plans" and that the BLM "will continue to amend or revise land use plans over time to adapt to changing circumstances (and) new information." *Id.* We are concerned that relying on older, out of date RMPs to guide solar development may pose risks to wildlife and natural resources due to the fact that no consideration was given to either this type or this scale of development when those RMPs were created. For this reason, we are also recommending that projects must comply with BLM wildlife policy (as mentioned above in relation to PODs).

We support the BLM's exclusion of critical habitat for threatened or endangered species, Areas of Critical Environmental Concern, Desert Wildlife Management Areas as well as habitat for select species from project development. However, we are concerned over the implementation of criterion #8 in Table 2.2-2. The criterion states that: "All areas where solar development proposals are not demonstrated to be consistent with land use management prescriptions for or where the BLM has made a commitment to take certain actions with respect to sensitive species habitat" will be excluded. In these critical cases it is unclear how the program will be implemented to ensure that a proposal will be deemed "consistent" with either agency prescriptions or commitments to certain actions for sensitive species.

Recommendations: The ROD should apply exclusions to not only solar energy development but also, generally, to associated infrastructure. The ROD should also revise criterion #8 in Table

2.2-2 to state that "…where the BLM has made a commitment to take any action with respect to sensitive species habitat" shall be excluded.

K. The Modified SEZ Program Alternative should clarify ROW application denial criteria.

In order to be effective, a screening program must contain meaningful denial criteria which ensure that applications for projects in areas deemed unsuitable for development do not move forward. We commend the BLM for articulating the agency's discretion to deny applications "that it finds to be inappropriate for solar ROW uses" and that "(p)rojects that will cause unacceptable impacts to important resources and values will be denied." DPEIS, p. A-28. To be effective, the denial criteria should be well understood and designed to minimize ambiguity.

Recommendations: The following clarifications to ROW denial criteria should be incorporated into the Modified SEZ Program Alternative:

- In order to effectively review and apply the "best available landscape-scale information" (including information from forthcoming Rapid Ecoregional Assessments and other efforts like California's DRECP), to establish project consistency, the agency should clearly define "other high-priority conservation, restoration, and/or adaptation objectives." DPEIS, p. A-28. These objectives should be clearly defined in the final EIS or at minimum prior to implementation of the program to ensure consistency with these critical conservation objectives.
- In order to effectively screen applications, the agency must define "high priority landscape features or focal areas important for conservation, restoration, and/or adaptation to climate change, including core areas, corridors, and buffers for vulnerable species." DPEIS, pp. A-28, A-29. It is our understanding that these may be features of the Rapid Ecological Assessments. We expect that if information provided by the Rapid Ecological Assessments is used to modify Resource Management Plans, those modifications would be reflected in the Solar Program. It is imperative that the Solar Program be consistent with information derived from the Rapid Ecoregional Assessments, given the goals and objectives of that critical effort.
- The DPEIS should clarify how "strong consideration" will be given to proposals utilizing previously disturbed areas and areas that will not impact sensitive resources in order to further encourage use of these lands as an alternative to undisturbed areas. DPEIS, p. A-28.
- The DPEIS states that "[t]o the extent that land use plans and/or this PEIS anticipate issues and concerns associated with individual projects, including potential cumulative impacts, the BLM will tier from land use plans and/or the PEIS analysis, thereby limiting the required scope and effort of additional project-specific NEPA analysis. For projects that are proposed in SEZs, only limited additional NEPA analysis may be necessary because of the depth of the analysis contained in the PEIS." As discussed in Section 1.II of this letter, the final PEIS should more clearly state how NEPA analysis would be constructed and used to support a decision regarding the denial of a solar ROW application. DPEIS, p. A-31.

L. The Modified SEZ Program Alternative should insist sensitive species habitat is protected in furtherance of its wildlife management objectives

The Draft PEIS states that "the BLM will review applications for land use plan conformance" at page A-27 and references Table 2.2-2 (at page 2-8) which includes as an exclusion area: "All areas where solar energy development proposals are not demonstrated to be consistent with the land use management prescriptions for or where the BLM has made a commitment to take certain actions with respect to sensitive species habitat." The final PEIS must clarify how proposals will demonstrate that they are consistent with RMP prescriptions for sensitive species habitat. All applications should conform to RMP wildlife objectives, including population management objectives for special status species.

Recommendation: The Modified SEZ Program Alternative should require applications to conform to RMP wildlife objectives, such as sensitive species management objectives and protected habitat areas.

M. The Modified SEZ Program Alternative should directly address the on-site use of fossil fuel to supplement the variable nature of solar energy.

The PEIS does not adequately address the potential on-site use of natural gas or other non-renewable fuels in the generation of electricity to "firm" solar generation. Natural gas-fired generation is a logical match with variable power resources like wind and solar. But the economic and environmental advantages of wind and solar can be eclipsed if a distinction is not clearly drawn between wind and solar development technologies that may require a minimal amount of natural gas and those whose primary fuel is a non-renewable fossil fuel.

Recommendation: The Modified SEZ Program Alternative should address the potential for on-site use of natural gas and other non-renewable fuels to supplement the variable nature of solar energy by establishing a reasonable cap in terms of the amount of power that can be produced by natural gas as part of the nameplate capacity of the proposed project.

N. The Modified SEZ Program Alternative should better protect the government's interests in the event of a transfer of project ownership

There have already been two high-profile ROW grant transfers resulting from the "fast track" process. In both cases, we understand the BLM had no role in the transfer of its approved ROWs from the sellers to the buyers. Thus, for example, the agency did not have a role in evaluating the implications of the transfer for the viability of the project as approved. In both cases, the new owners have already expressed their interest in significantly modifying the approved projects, upending months of work spent completing environmental reviews and processing permits. As important, the scarce resources available to conduct these environmental reviews were unable to be spent instead on processing other applications.

The government has a clear interest in ensuring that the transfer of an approved permit will improve, or at least not adversely affect, the chances of successful completion of the project. The BLM must ensure the Solar Energy Program evaluates technical and economic viability of

parties interested in acquiring approved right-of-way grant authorization before transfer regardless of whether the ROW grant is formally reassigned. Additionally, current and future right-of-way grants must include language requiring BLM review and application of the same criteria in the event of a change in ownership of the company holding the grant.

Recommendation: The BLM must ensure the that its Solar Energy Program is equipped to evaluate the viability of parties interested in acquiring approved right-of-way grant authorization before transfer. The Modified SEZ Program Alternative should incorporate a requirement for BLM to review right-of-way grants if ownership of the company holding the grant changes and consider whether the ROW should be continued.

O. The PEIS treatment of technology should be strengthened in the Modified SEZ Program Alternative.

We have a number of concerns regarding the draft PEIS's overview of solar technologies. These are addressed in greater detail in Appendix VI to our comments. Four key substantive points are summarized here.

1. BLM's approach to solar technology should be principle-based. We believe it is important that the BLM explicitly acknowledge that solar technology is rapidly evolving and that there are a number of possible permutations and advancements that are now on the horizon that could significantly affect this technology. Consequently, the BLM's approach to solar development should be principle-based and not based on current technology capabilities and characteristics.

2. BLM should revise the criteria used to evaluate solar technologies. The criteria by which the BLM proposes to evaluate the merits of certain solar technologies should be revised to focus on:
   a. Resource consumption per annual megawatt hours (MWh) produced by the plant. We recommend that this metric be used to judge all cross-system (not just cross-technology) comparisons. Under this criterion, for example, the requirements for land and water would be compared in acres/MWh/year and acre-ft/MWh/year. In addition, some qualitative benefits would accrue to a plant that used storage to match its output to the peaking needs of the grid it is serving.
   b. Compatibility with the existing grid. Although this can be difficult to define in the most general way, it should include such characteristics as dispatchability, load balancing, and dependability of providing peaking capacity. We believe that use of these criteria can reduce need for additional infrastructure, including for example combustion turbines for spinning reserves and so on.
3. BLM should revise its treatment of how CSP systems operate. The draft PEIS does not accurately describe two important aspects of how CSP systems operate. These relate to a CSP plant's capacity and size and to operating temperature and efficiency. The mischaracterizations detailed in Appendix VI could lead the BLM to unfairly evaluate the potential benefits associated with proposed CSP projects. We recommend that the BLM rewrite the technology-related sections of the draft PEIS to correct these significant inaccuracies.

3. BLM should include climate change impacts on the performance of technologies. The draft PEIS makes no reference to climate change impacts may have on either the future need for, or the performance of, the solar systems. We recommend that the BLM include references to the results of current climate change models, and briefly describe how the predicted changes could impact these technologies. Inclusion of these effects would increase the draft PEIS' adaptability as these effects become more apparent. It is important for BLM to address this issue, so that both the BLM and other stakeholders can fairly evaluate a broad range of projects and programs in the future.
4. BLM should include in their analysis the amount of land produced per megawatt as part of a technology analysis. We believe this is an important metric to use in evaluating solar energy technologies.

Recommendations: BLM must strengthen the treatment of technology in the PEIS by revising the criteria it uses to evaluate solar energy technologies, the discussion of how CSP systems operate, and the discussion of how climate change impacts the performance of technologies.

P. BLM should make decisions under the ROD on the basis of capacity-factor adjusted power production, not nameplate capacity power production.

The RFD estimates the need for additional acres by analyzing a total number of megawatts that could be installed on public lands under the SEZ Alternative and the Preferred Alternative. In the RFD scenario, BLM uses two approximations for determination of a reasonable build out under state RPSs and NREL's Regional Energy Deployment System (ReEDS). This is a useful first pass at approximating how many acres could be included in each of the alternatives, but to increase the accuracy and transparency of its SEZ program in a Modified SEZ Program Alternative, BLM should analyze needs based on megawatt-hours of demand for renewables instead of nameplate capacity. By analyzing and reporting demand in megawatt-hours, or power produced, the capacity factor of solar technologies will be built into BLM's recommendation for total acres that should be designated within zones.[39] Defining acres in terms of megawatt-hours of demand supports already existing planning exercises at the local, state, and regional level geared towards meeting demand, which describe load forecasts in terms of power produced, not nameplate capacity.

There are logical benefits of describing needs in megawatt-hours instead of megawatts. First, state RPS goals—calculated as a percentage of total demand that must be met through renewable energy—are set in megawatt-hours. In addition, planning entities at the sub-state, state and regional level, calculate megawatt-hours as they are spread over the length of the planning period. These load forecasts vary over peak load and off-peak load seasonal and daily demand

[39] Alternative capacity factors result in differences the MW/acre potential output of each solar technology and therefore the number of total acres needs to meet renewable demand, dependent on which technology is used. BLM has determined a capacity factor of solar technologies available on the market in setting a "Megawatt Capacity Fee" for three solar technologies in its Instruction Memorandum No. 2010-141, dated June 10, 2010. As of the date of this filing, BLM's capacity factors for solar are: Photovoltaic (PV), 20% capacity factor; concentrated PV and concentrated solar, 25% capacity factor; concentrated solar with storage of 3+ hours, 30% capacity factor.

curves. The groups submitting these comments recommend that BLM remain consistent with the existing methods for describing electricity demands that are already in place at regulatory agencies and planning authorities. In effect, the designation of zones amounts to a reprioritization of resource management plans for federal lands, towards energy production in lieu of other values. BLM solar zones should reflect the state and regional energy objectives that have already been established. BLM's role in managing public lands should follow the direction of existing electricity policy.

Recommendation: The Modified SEZ Program Alternative should use capacity-factor adjusted power production rather than nameplate capacity power production to ensure consistency with existing methods for describing electricity.

Q. The Modified SEZ Program Alternative should employ science-based management

When considering the intensive development under a solar energy program, there will certainly be significant impacts to biological resources, including sensitive habitat types and associated fish, wildlife and plant populations. The degree of those impacts rests a great deal on how BLM structures siting and mitigation decisions. Given the magnitude of the development and the range of biological resources at risk, it is of utmost importance that BLM clearly define a science-based planning strategy to first avoid, then minimize, and, for truly unavoidable impacts, mitigate impacts to biological resources.

The key to building an environmentally sound, legitimate solar development program will be through the consistent and transparent adherence to science-based planning and decision-making processes, along with well-articulated policy objectives, decision and evaluation criteria that permit stakeholders and the public to understand and support the rationale behind BLM zoning, siting, and mitigation decisions.

According to scientists in the field of decision-making, there are three essential "ingredients" to science-based management:

- Well-defined, measurable standards (i.e. wildlife population or habitat condition targets), developed via public involvement processes;
- The employment of science-based analytical tools to evaluate compliance with the standards (e.g. population viability analysis, or the spatially explicit Decision Support System recommended by the Western Governors' Association); and
- Consistent implementation of science-based analysis and decision-making (i.e. dedicated funding for monitoring and science-based adaptive management processes).[40]

Science-based management of natural resources encourages the development of policy objectives and standards that will give shape to these aspirational goals, as well as the construction of effective and efficient methods to evaluate whether or not the objectives are being met. A second example exists with the statutory objective to "minimize" impacts to the environment.

[40] D.J. Rohlf, *Science, Law, and Policy in Managing Natural Resources: Toward a Sound Mix Rather than a Sound Bite*, 127-142 (2004) *in* K. Arabas and J. Bowersox, eds. *Forest futures: science, politics, and policy for the next century.* Rowman and Littlefield, Lanham, Maryland, USA.

Decisions that are based on clear criteria, including threshold criteria, both for the avoidance and mitigation of impacts to biological resources, are likely to be more structured than decisions that are made absent clear decision criteria. Structured decisions are those where stakeholders can agree upon clear policy objectives, as well as the means of measuring those objectives.

BLM should take the opportunity to avoid controversy and conflict from the outset in this new program for solar development. One suggested method, and one that the BLM appears to be using, is to avoid designation and development of land types with known high-conflict values, and instead prioritize low-conflict areas (substantive detail on high-conflict and low-conflict land types are described below). Threatened, endangered and sensitive species habitats; unique habitat features; high integrity terrestrial and aquatic ecosystems; wildlife movement corridors – all should be considered high-conflict land types. On the other hand, mechanically-disturbed lands (including non-Federal lands) located in proximity to existing infrastructure, including road networks and transmission facilities, will enjoy much higher probability of project success and sustainable energy production.[41] Of course, land management decisions are often most challenging for the "places in between," where values collide and there is not a clear path to avoid conflict. Having a structured decision-making process, with clear criteria that can guide tradeoff decisions, in place for these types of scenarios is essential to achieving sustainable conservation outcomes.

Challenges associated with the application of biological information to decision-making are significant. While we applaud the BLM for recognizing sensitive resource areas, we understand that knowledge of BLM-managed ecosystems and the components of those ecosystems are limited, as is our understanding of how large-scale energy development will impact the structure, composition and function of desert ecosystems. We applaud the fact that the BLM is embarking on comprehensive science-driven "ecoregional assessments" of the ecosystems of interest to this planning effort. The need for these assessments validates the fact that biological data, information, and knowledge of these ecosystems is limited. For this reason, we expect the BLM to not only provide information on known biological resources (*e.g.* sensitive species population/habitat conditions) within the study areas, but also a comprehensive discussion of uncertainty (both of baseline biological conditions, as well as in relationships between solar development and biological resources), known information gaps, and processes to collect and apply information future decision-making processes. We expect, for example, a complete inventory of sensitive species population/habitat conditions for all solar study areas, based on our research.

Recommendation: BLM should define a science-based management strategy for biological impacts in its Modified SEZ Program Alternative. This should be based on science-based planning as well as sound policy objectives.

[41] Our groups do not consider lands that have been grazed by domestic livestock, whether publicly or privately owned, to be "disturbed."

SECTION 2. DEPARTMENT OF ENERGY ACTION

The Department of Energy (DOE) has a long history of promoting and advancing utility-scale solar energy research and technology, particularly within its Office of Energy Efficiency and Renewable Energy, the Solar Energy Technologies Program, and the Loan Guarantee Program. The accomplishments of DOE's solar energy programs are based on directives laid forth in a number of statutory requirements and Executive Orders, such as expedited review of permits, technological advances related to access to transmission and water use, and advancement of local planning efforts.[42] These gains have resulted in the expansion and advancement of utility-scale solar projects.

DOE's participation in and contribution to the Draft Solar Programmatic Environmental Impact Statement (DPEIS) is defined in its purpose and need statement: "to satisfy both [Executive Orders] and comply with congressional mandates to promote, expedite, and advance the production and transmission of environmentally sound energy resources, including renewable energy resources and, in particular, cost-competitive solar energy systems at the utility scale" (Section 1.4.1).

In its preferred alternative, DOE proposes to integrate environmental analysis, mitigation measures, and other considerations as enumerated in the DPEIS into its evaluation and selection of solar energy projects and technologies seeking DOE funding and support. The agency believes that inclusion of these considerations will help increase the pace of solar energy development and decrease environmental damage, project costs, and stakeholder opposition associated with solar energy projects, therefore helping DOE to meet its legal mandates.

More specifically, DOE proposes to use the Bureau of Land Management's (BLM) analysis in the DPEIS to "provide a technical basis for development of guidance." This guidance would be used to help DOE determine which solar energy projects and technologies to invest in, as well as to develop recommendations for project proponents applying for DOE funding to consider in their applications. Notably, this guidance would apply to all solar energy technologies funded by DOE on federal, state, and private lands.

Because the goals of increasing solar energy development and protecting ecological and cultural resources are not mutually exclusive, we support DOE's preferred alternative. However, DOE should make improvements to this alternative to ensure that it can make informed decisions that support projects and technologies with minimized impacts.

I. Analysis of Alternatives

DOE proposes two alternatives: no action and the proposed action. Under the no action alternative, DOE would continue its business-as-usual methodology of analyzing environmental concerns with the solar projects it supports. It would not develop guidance to improve

[42] Executive Order 13212 (2001), Executive Order 13515 (2009), and Section 603 of the "Energy Independence and Security Act of 2007."

environmental analysis and consideration or recommend mitigation measures that would be applied to DOE-funded solar projects.

The proposed action—and the preferred alternative—would require DOE to use the findings in the DPEIS to develop programmatic guidance that would integrate environmental considerations into its selection process for project funding. The guidance would also specify best practices for DOE solar funding applicants to consider when submitting applications for funding, especially for investment and deployment strategies. Basing this new guidance in the findings of the PEIS allows DOE to make more thorough and sound decisions, and would allow the agency to invest in the least-impactful solar technologies. In addition, the new DOE guidance would include mitigation recommendations for project developers to consider when applying for funding that would address programmatic technology performance goals. This new guidance would help streamline analysis and documentation for projects funded by DOE.

DOE recognizes a number of benefits of selecting the preferred alternative (Section 7.1).

- With new guidance, the agency will be empowered to make more informed decisions about investing in projects that minimize environmental impacts such as land disturbance and water usage.
- Guidance to develop mitigation recommendations for funding applicants will streamline environmental analyses and provide developers with more certainty about the prerequisites for winning DOE financing.
- Guidance for DOE and project funding applicants will spark faster approval in federal and state permitting processes, decreased costs linked to project modification, and reduced opposition. This new funding criteria will also result in quicker construction of renewable energy projects that reduce greenhouse gases and other hazardous combustion-related pollutants.

These benefits help DOE to meet its mandates as described in the purpose and need statement.

Adverse environmental impacts can be caused by a quicker pace of solar energy development, but are hard to quantify given the goals of DOE's proposed action.

I. Support for the Department of Energy's Preferred Alternative

We support DOE's preferred alternative to develop guidance both that would incorporate environmental concerns into DOE's own review of projects and for project proponents seeking to win funding. This alternative will minimize adverse environmental impacts and also help DOE to meet its legal requirements to increase the pace and decrease the costs of solar energy development.

In scoping comments for this PEIS, which many of our organizations submitted, we called on DOE to use the DPEIS as an opportunity to mirror the process and analysis being conducted by the BLM. DOE has undertaken this task in proposing to develop new guidance for selecting environmentally-sound solar projects.

Even though DOE notes that "In all likelihood, only a small percentage of utility-scale solar energy development projected in the [Reasonably Foreseeable Development Scenario] would be

directly attributable to DOE's proposed action," it nevertheless makes sense to screen projects early on to make sure that they succeed. With better decisions on where to make technology and resource investments that minimize environmental impacts, as well as mitigation recommendations for solar developers, DOE will be working towards an increased pace of solar development, stronger and more resilient projects, and lowered costs for solar energy systems at the utility scale. Our organizations support all of these goals.

II. Recommendations for Improvements to the Department of Energy's Preferred Alternative

In the Final PEIS, DOE should improve its analysis in order to strengthen the proposed action and preferred alternative. In particular, it should:

- Improve the description of the current DOE solar energy program and its existing guidance. BLM details its current process for issuing rights of way for large solar energy projects (Section 3.7), but DOE does not describe its current process for identifying which solar energy projects and technologies to fund. In the Final PEIS, DOE should disclose the types of solar projects that it currently funds in addition to the specific environmental concerns that it takes into account for funding through its various solar energy programs. DOE should also establish which program offices will utilize the PEIS and new guidance in their decision-making processes.
- Broaden the scope of its analysis with regard to categories of affected lands and resources. BLM describes and evaluates the lands and resources to be affected by the PEIS (Chapter 4), and DOE must expand upon this analysis because it funds projects sited on federal, state, private, and tribal lands.
- Clarify what is meant by the intention to streamline future environmental analysis and documentation for DOE-supported projects (Section 2.3.2.1).

Additionally, DOE has an opportunity the Final PEIS to provide even further certainty to developers and promote the right kind of solar energy development by commiting to supporting only low conflict projects. Specifically, DOE should:

- Provide assistance to only those public lands solar projects only that BLM's screening tool finds to be "low conflict" or that are located within zones. This would lead to solar development that is faster, cheaper, and better for the environment, consumers and project developers.
- Give a preference and/or incentive for solar energy projects on previously-disturbed lands in order to minimize environmental impacts and create jobs in the places that need them the most.
- Demonstrate its commitment to rapid deployment of solar energy projects by indicating a presumption against funding projects on public or private lands in areas with sensitive natural or cultural resources; projects in these areas are likely to be litigated and delayed.
- Commit to only supporting projects for which thorough cultural resource consultation has been completed.

APPENDIX I. ANALYSIS OF REASONABLY FOREESEABLE DEVELOPMENT SCENARIO

A. Overview

The BLM, the Interior Department and the Energy Department are to be commended for including a Reasonably Foreseeable Development Scenario (RFD) in the draft Solar Energy Development PEIS. Such an analysis relates directly to the task that this PEIS as a whole has been assigned to fulfill and the failure to present one would have constituted a fatal flaw of this document. The RFD that is presented is aggressive both in terms of amount of renewable energy needed in the study area through 2030 and in terms of the amount of solar energy the public lands will provide to meet that need. Precisely because the RFD is so aggressive, it clearly documents that the Solar Energy Zones alternative – supplemented by a system for designating additional zones as needed as the groups submitting these comments advocate – will allow ample room for solar to grow responsibly and thrive sustainably on our public lands. In this section of these comments we comment on the methodology used to create the RFD, suggest some improvements and then detail our conclusions about the RFD and its assumptions.

Development of the RFD. The Draft PEIS used two methods to estimate the RFD scenario or amount of power that would be generated in the six-state study area over the next 20 years. One involved the Regional Energy Deployment System model developed by NREL, while the other used each state's Renewable Portfolio Standard (RPS) to estimate corresponding renewable energy and solar development. Both of these methodologies are appropriate tools for accomplishing the task at hand and we doubt that there is a "better" single way to estimate the RFD scenario for the study area. [43]

Table 1 shows the results of the two methods of scenario development.

Table 1. Results of the Renewable Energy Modeling used in the Draft PEIS

Solar Capacity from:		Arizona	California	Colorado	Nevada	New Mexico	Utah
ReEDS Model (MW)	BLM	1,768	2,207	98	1,153	353	0
	Non-BLM	1,724	8,487	2,197	548	3,204	0
RPS-based Method (MW)	BLM	485 - 2,424	3,084 - 15,421	439 - 2,194	348 - 1,701	167 - 833	244 - 1,219
	Non-BLM	162 - 808	1,028 - 5,140	146 - 731	116 - 567	56 - 278	81 - 406

While the results of the two modeling approaches utilized predict extensive solar development, there is substantial variation between them as shown above. The Draft PEIS used the maximum

[43] Were the BLM to prepare a new RFD scenario and do so with the goal of obtaining a more realistic estimate of future needs, rather than one that established the outer bound of expected development, we suggest that rather than use a single RFD analysis for all states, an approach should be taken that would allow the analysis to take into account such factors as state RPS requirements, amount of private land, and where development is being proposed.

estimated development as projected by the RPS-based method to establish an upper bound on potential development and associated environmental impacts. It then employed various assumptions to predict how the maximum estimated development might be allocation between BLM-administered lands and private lands. These assumptions are discussed below.
To evaluate the RFD scenario, we contracted with Aspen Environmental Group to review the following items for each state:

- current renewable energy capacity,
- current RPS compliance,
- perceived capacity to achieve RPS compliance,
- renewable energy proposed (both on land managed by the BLM and on private, state, or other federal land), and
- Public Utility Commissions' (or equivalent) concerns and communications.

Some of the data assembled for this analysis are included at the end of this Appendix.

B. Primary Conclusions Regarding RFDS

Based on the available information for each state, it appears clear that the RFD scenario is very aggressive, i.e., that it significantly overestimates the amount of renewable energy that will be needed in the study area in general and the amount of solar energy development that will take place on public lands. Because of these features, the RFD provides a useful basis on which to assess the upper bound of environmental impacts that such development might result in as well as of the need for and viability of the two approaches to development that are considered in the PEIS – the solar zones option and the preferred alternative. Indeed, the RFD scenario amply demonstrates that there is more than enough room in the proposed zones to allow solar development and the solar industry to continue to grow on public lands while simultaneously allowing the BLM, other land and wildlife managers and stakeholders to gain experience with the processing, permitting, construction and operation of these huge projects as well as that there is enough time to permit the identification and designation of additional zones for additional development if and when needed.

1. The RFD Overestimates Renewable Energy Demand That Will Be Met By Utility Scale Generation In General and By Utility Scale Solar Plants In Particular

The RFD scenario overestimates the amount of renewable energy demand that will be met in the study area by utility scale generation in general and by utility scale solar generation in particular in three ways each of which is discussed below: first, because it assumes applicable RPSs will be met chiefly by utility scale generation, an assumption that is clearly changing in at least California and Arizona; second, because it assumes that 50% of applicable RPSs will be met by solar development at whatever scale; and third, because it assumes that 75% of the solar that will be generated to meet 50% of RPS will come from public lands. These assumptions, as indicated, have produced an RFD that is definitely very aggressive in terms of the kinds and amount of solar energy to be produced from the public lands.

a. Assumptions about the role of large utility scale generation in meeting RPS are changing.

The RFD scenario assumes that the bulk of RPS needs will be met by large utility scale generation. Even two years ago, this assumption might have been sound. At that time, solar developers, regulators, utilities and members of the Public Utility Commissions (PUCs) in many states were assuming that the permitting, construction and operation of utility scale solar projects would proceed with relative ease and, as a result, they favored a paradigm which relied heavily on such projects to meet RPS goals. However, such an assumption is clearly changing – perhaps as a result of experience with the "fast track projects" that were permitted in 2010 in the study area.

Regulators in California set records in permitting large scale solar projects in 2010, on both public and private lands. Even as those records were being set, however, utilities began showing marked interest in projects significantly smaller than utility scale. For example, in California there are a number of rooftop projects currently proposed/being developed by several of the investor owned utilities. See, e.g., CPUC Quarterly Report (which reveals that there are over 250 projects between 1-2 MW in size requesting interconnection to the grid for a total of over 500 MW). In addition, numerous projects smaller than utility scale have been proposed for private lands in California. For example, according to a chart produced by the Renewable Energy Action Team, a team comprised of federal and state regulators and formed for the purpose of facilitating renewable energy generation in California, that is entitled 2011 Generation Tracking for Renewable Projects (hereinafter referred to as "2011 REAT chart"), approximately 70 solar projects of 50 MW or less in size have been proposed and are potentially permittable in 2011. (This REAT chart is included as Attachment 1 at the back of this Appendix.) These projects, together with six that are between 60 and 90 MW in size, would produce almost 2000 MW. Id. Similarly, in Arizona, there is a clear trend by the state PUC to permit smaller projects, albeit projects that are still large by most measures (i.e., up to 100 MW. These examples reveal that, as a result of assuming that renewable energy demand in the study area will be met by large utility scale generation, the RFD scenario over-estimates how much large utility scale is needed.

b. Assuming that 50 percent of RPS will be met by solar development is very aggressive

The RFD scenario assumes a high solar scenario (50% solar and 50% other renewables).[44] While some states' RPS goals prescribe the percentage of solar energy required to achieve those goals, the highest percentage of solar prescribed in the six states covered by the PEIS at the time the draft was written was 20%.[45] Based on our analysis of the types of energy currently used to achieve the interim RPS goals and on these states' histories with renewable energy, a 50% scenario is definitely aggressive, and likely does not adequately account for grid integration issues such as demand profile and storage requirements.

[44] As noted above, the reason for assuming this high solar scenario was to enable the upper bound on potential environmental impacts of solar development on public lands to be estimated.

[45] The California RPS was increased to 33% by law on April 12, 2011. However, the investor-owned utilities are close to meeting their 20% target and are expected to be fully compliant by the end of next year. See, e.g., "CALIFORNIA: Private utilities reached 18 percent renewables in 2010, using mostly geothermal and wind," Energy and Environment, March 4, 2011. Hence all the energy produced from projects permitted on public lands after completion of the PEIS will be allocatable to meeting the new standard.

To date, data from state public utilities commissions in the study area states or individual providers reveal that states are achieving their RPS goals primarily through wind and geothermal power (and hydroelectric power in those states that allow hydroelectric power to count toward the RPS goals). See Attachment 2 at the back of this Appendix. In Colorado, for example, a total of 1224.5 MW of renewable energy capacity is on line, 1200 MW of which comes from wind and 24.5 MW from solar. In Nevada, there is 79.3 MW of solar energy capacity out of a total of 418.2 MW; geothermal makes up the lion's share of renewable energy in that state – 315 MW. In Utah, out of a total of 570.7 MW of renewable energy capacity on line, the bulk comes from hydro – 286.5 MW – and from wind – 224.8 MW. The picture is similar when it comes to renewable energy net generation by source. See Attachment 3 at the back of this Appendix.

To date, there are no indications that the utilities in the six state study area will stop purchasing large amounts of geothermal and wind power and switch to purchasing solar power except to achieve any applicable diversity requirements. Accordingly, we would submit that it is clear that, because the RFD scenario assumes that 50% of RPS will be met by solar, it significantly overestimates that technology's contribution to the energy needs of the region.

c. Assuming that 75% of solar development will occur on BLM Land is also aggressive.

The RFD scenario assumes that 75% of all solar projects in the six state study area will be constructed on public lands because of the Administration's decision to prioritize solar energy development. As recently as two years ago, the solar industry, utilities and regulators assumed that the bulk of renewable energy development including especially solar development would take place on public lands. Today this assumption too is changing, however.

For example, California currently has more solar energy proposed on private land than on BLM land. As revealed by the 2011 REAT chart, attached to this Appendix, there are currently 8,258 MW potentially permittable on public lands at this time out of a total of a total of 16,950 MW. In addition, California currently has close to the RFD scenario estimate for solar energy on BLM-administered land proposed on private/state land. Id. [46] Indeed, it appears that, as of February 2011, 12,842 MW have been planned, proposed or permitted on public lands in that state. [47] The 2011 REAT chart indicates that 3,965 MW of large-scale projects (100 MW and above) are proposed, along with the almost 2000 MW of smaller projects referred to above. Clearly, these examples indicate that developers are re-assessing the desirability of putting all their eggs in the federal land basket.[48]

Moreover, while regulators in California set records in permitting large scale solar projects in 2010 – proving beyond a shadow of a doubt that they could permit such projects speedily despite their lack of experience with the technologies involved, the scale of the projects proposed and

[46] This MW total, which was calculated based on available information including the 2011 REAT chart, does not include rooftop solar projects currently proposed/being developed by the state's investor owned utilities.

[47] [insert from HOS] his figure does include the projects that were permitted last year in California on private land for a total of at least 480 MW.

[48] Mitigation costs may be among the reasons for this re-assessment. Because most BLM-land is undeveloped, many public land projects will have higher mitigation costs than those on private disturbed lands. As a result the mitigation burden on public lands may well result in a comparative financial disadvantage when compared to that alternative.

their impacts, the fact is all the projects permitted on public lands to date have been challenged in federal court and it remains to be seen whether the approvals and permits issued will withstand those challenges. The outcome of those cases, in other words, may well affect the desirability of development on public lands to potential developers. Indeed, the available data clearly indicate that, even before all the pending suits were filed, developers were re-assessing the desirability of public lands based on the 2010 experience.

The draft PEIS itself provides information about solar proposals on public lands that suggests that the public land paradigm is shifting. According to data provided in Appendix B of the PEIS, there were 31 fewer proposed projects at the end of 2010 when the PEIS went to print than there were at the beginning: 1 fewer in New Mexico and 35 fewer (or 50% of all proposed projects) in California while very small increases of 1, 2 and 2 more projects in Nevada, Colorado and Arizona respectively.[49] At the end of the year, Utah still had no renewable applications on public lands. At a minimum, these data may also reflect the trend away from public lands in California discussed above.

The RFDS assumes that 75% of all solar projects would be constructed on BLM-administered lands because of the agency's decision to prioritize solar energy development on those lands. This percentage may turn out to be the case in states such as Nevada, where the BLM administers a large proportion of the lands within the states' borders and/or where there is a history of renewable energy development on BLM-administered land. In Nevada, for example, close to 40% of the RFD scenario estimate has already been approved for development on BLM land.
However, it may not be the case in other western states where there is more available private land on which to build solar projects and where the state itself is prioritizing renewable energy development. For example, as noted above, California currently has more energy proposed on private land than on public land – and has many more acres of lands that have been mechanically disturbed and hence potentially lower resource conflicts in private ownership than on the public estate. Many of these private land projects too are smaller allowing for faster and simpler environmental review. Accordingly it seems quite reasonable to assume that in California less than 75% of the solar development will occur on public lands.

Similarly, the 75% development assumption may not be the case in states which have already indicated certain areas for prioritization of renewable energy. Colorado, for example, has identified Renewable Resource Generation Development Areas where renewable energy could be prioritized. The San Luis Valley GDA currently has approximately 544 MW of solar energy proposed, more than is currently proposed on BLM-administered land in Colorado.

In any event, the assumption that 75% of solar development would occur on public lands unquestionably skews the RFD scenario toward more public land development. This skewing is

[49] The majority of the decrease In California is undoubtedly attributable to the BLM's aggressive screening of applications on file to determine their technical and financial feasibility – an approach that our organizations strongly support. In other states, it may be the difficulties in building large scale solar is slowing interest in these projects and/or that developers have already filed applications on sufficient or more than sufficient public land acreage for their actual development plans. The economy too has undoubtedly affected these trends.

further amplified for some states by the use of a single RFD scenario for all six states despite the significant differences among them as discussed above. Again, as indicated above, this single scenario may turn out to be the case in some states, such as Nevada where 85% of the land is administered by the federal government and there is a history of renewable energy development on BLM-administered land, but it may not be the case in other states, such as California where the amount of energy projected under the RFDS seem both exaggeratedly skewed toward solar and skewed toward solar on BLM land.

Conclusion. The very aggressive RFD Scenario Clearly Supports a Comprehensive Zone-based Approach.

The Interior Department clearly had a reasonable basis for adopting an aggressive RFD scenario in connection with the preparation of the PEIS. As noted above, use of such a scenario allows for the estimation of the upper bound of likely environmental impacts from the proposed program and alternatives. That said, it is clear from the analysis above that the scenario that was used over-estimates what is likely to occur in the future on our public lands.

As a result, the RFD scenario supports selection of only a comprehensive zones-based approach which is close to only one of the two action alternatives considered in the PEIS – Alternative 2, the zones development alternative. The RFD scenario documents the availability of ample potential in the proposed zones to increase solar generation and grow solar development responsibly – especially considering the large number of existing applications outside of the proposed zones which our groups expect BLM to review,[50] while the BLM gains experience in developing, permitting and monitoring the operation of large scale projects as well as in understanding the impacts of individual projects and other solar projects in the same and different geographic regions.

To be more specific, one can do a rough, back-of-the-envelope calculation of the amount of BLM land that will be required to develop even the very aggressive numbers reflected in the RFD scenario. That scenario envisions a high estimate of up to 23,792 MWs of solar being developed on BLM land (although, as previously indicated, the real number is likely to be

[50] Currently there are about 166 applications for solar development on BLM-administered lands in the study area. See, e.g., NRDC, "Bureua of Land Management Utility-Scale Solar Applications – A Geospatial Survey of Active ROW Applications," April __, 2011, submitted for the record on this draft PEIS by NRDC and others (hereinafter "NRDC Report"). While it appears that a number of these applications are located in proposed zones and many are outside. (One application overlaps a proposed zone slightly.) Id. In Arizona, for example, there are no existing applications within zones but 36 outside them. Id. at 3. In California, according to data provided by the State BLM Office on March 7, 2011, there are currently a total of 19 first in line applications within the four proposed zones, and at least 14 first in line applications outside them. There are no applications within the zones proposed in Colorado, but approximately two outside as of this date. Nevada appears to have six active applications within proposed zones and 44 outside them, while New Mexico has one application within and two outside the zones. See NRDC Report supra. Utah has no public land solar applications, as indicated above.

Although Alternative 2 in the PEIS contemplates no development outside the identified zones, as indicated immediately above, none of our groups actually expect the BLM to reject all applications outside of those zones. Some of these applications will be approved and as a result some development outside zones will unquestionably go forward. This additional development will contribute to actual needs of the states in which it is located as well as to achieving the RFD scenario presented in the draft PEIS. The same is true of any MW generated as the result of projects permitted by the BLM last year.

significantly lower). With a mix of solar technologies, with solar thermal generally requiring fewer acres per MW (5-7) and PV requiring more (as high as 10-12), even using the 12 acre/MW maximum, we get a total acreage of 285,504 necessary for solar production. Using the average, a generous 9 MW/acre, would produce a requirement of 214,128 total acres in the six states. (While additional acres may be needed for substations and transmission, the actual number would be very small by comparison). The proposed Solar Energy Zones in the PEIS include a total of 677,384 acres. Allowing for the fact that not all of these acres will be suitable for solar development, it is still very likely that sufficient land will be available to meet the projected need in these zones alone.

Furthermore, analysis of data in the draft PEIS reveals clearly that in all cases except Arizona, the proposed zones hold more than the RFD scenario build out would require without including any development outside the zones. Indeed, in some states, the zones hold significantly more than is needed to support that build out – again, even without counting generation from any other source. The California SEZs, for example, could potentially produce at least twice as many MWs as projected under the RFD scenario, while the SEZs in Nevada could potentially build out at least nine times as many MWs and those in New Mexico could potentially build out at least 12 times as many MWs. It is equally clear that at least in those states, the proposed SEZs could be reduced significantly and the scenario still achieved[51] – especially if, as we recommend, a process for adding new zones is included in the new program.[52]

In short, the RFD scenario proves that a comprehensive zone-based solar development program would provide a safety net for agency planners and decision-makers as well as the solar industry and the public lands. As noted immediately above, this is even truer if the Department includes in its new solar program a process for adding additional zones if needed which would provide even further assurance to all concerned that real needs for the generation of solar energy on public lands will be met in the future.

In contrast, selection of Alternative 3, the BLM's preferred alternative, which essentially amounts to a free for all approach to siting of large scale solar projects in our deserts, would not only be inconsistent with the RFD scenario, it would also be inconsistent with the requirements of the Federal Land Policy and Management Act of 1976 (FLPMA), 43 U.S.C. § 1701 et seq., the BLM's Organic Act. FLPMA mandates that the Secretary "take any action necessary to prevent unnecessary or undue degradation of the [public] lands." 43 U.S.C. § 1732(b). Throwing open more than 21 million acres of public lands to the siting, construction and operation of huge solar power plants will have attendant significant and, in many cases, unmitigable impacts as revealed in the EISs the Interior Department prepared on the power plants it permitted on public lands in California last year and doing so *when it is demonstrably unnecessary* as revealed by this PEIS simply cannot be squared with that mandate.

[51] The one caveat that applies to this statement relates to BLM's assumption that 80% of the acreage within zones will be developed. This amount of acreage may not actually be available. In California's Riverside East SEZ, for example, less than 80% of the land within the zone may be developable in large measure because of the sand transport corridor which traverses much of the zone. However, as noted above, there is the potential for development outside of the California zones as well as development within new, additional zones to "make up" for this unavailable land. Moreover, the PEIS estimates that it takes 5 acres/MW for solar trough technology and 9 acres/MW for other technologies. The California BLM uses higher ratios for all projects. If the California numbers had been used in the PEIS, the MWs "lost" from that particular zone would be reduced.

[52] The process we recommend that the Interior Department adopt is discussed infra in Section I.

The selection of Alternative 2 is further supported by existing information that we have obtained regarding contract failure. In connection with our research for preparation of these comments, we learned that contract failure is currently at between 15 and 30%.[53] To insure against contract failure, especially failure of utility-scale projects like those that have been permitted and proposed for public lands, utilities are now concentrating on smaller projects (less than 100 MW). The California PUC identified insurance against contract failure as a reason to increase feed-in tariffs for distributed solar projects. Focusing on places where projects are most likely to be successful as the zones-based alternative would do is another and easier way to help utilities guard against contract failure.

STATE-LEVEL RPS INFORMATION

Arizona

- *Approximately 17% of the state is BLM-administered land - 12.2 million surface acres*

At this time, Arizona BLM is actively processing three ROW applications while four utility scale solar projects are proposed on BLM land. Therefore, it seems unreasonable to assume most of the utility scale solar development would be on BLM land. The renewable energy that is already developed and currently under development is on private land and the total number of MW of these projects – 350 MW – is close to half of the estimated solar energy on non-BLM land under the RFD scenario.

California

- *Nearly 15 % of the state is BLM-administered land, 15.2 million acres*

Given the acres of mechanically disturbed (agricultural) land that appears to be available for solar development in the Central Valley, it seems unreasonable to assume that more solar energy would be developed on BLM land than on private land. This is especially the case given the high priority California has placed on renewable energy development throughout the state, not just on BLM-administered land.

It is also important to note that all of the BLM-approved solar projects on BLM-administered land are currently the subject of federal court litigation. Many smaller projects proposed on private land that is less environmentally sensitive have been undergoing environmental review with Negative Declarations or Mitigated Negative Declarations allowing for a faster development schedule. Moreover, the BLM in California reports that it is seeing few new ROW applications and that, more often than not, the new applications that it has received are applications for gen-ties crossing public lands, rather than for solar power plants.

Given the reduced environmental effects of solar projects on previously disturbed agricultural and other private lands as compared to undisturbed pristine desert, it is not only likely that less than 75% of the solar development in California will be on BLM-administered lands, it is even possible that solar development on private land in the state could overtake that of BLM-administered lands over the next couple of years.

[53] Indeed, one utility has suggested that it is using a 40% failure rate for its internal planning purposes.

Colorado

- *Almost 12.5 % of the state is BLM land, 8.3 million acres*

For the Colorado RFD scenario, the two models used to estimate the amount of solar required for the RPS goals resulted in virtually opposite estimates. The ReED scenario put close to 100% of solar energy development on private land and the RPS model put close to 100% of the solar energy development on BLM land. Colorado currently has more solar energy proposed on non-BLM administered land than solar energy proposed on BLM-administered land.

Also, Colorado does not require a specific percentage of the RPS to be solar; it focuses instead on distributed generation. Given Colorado's extensive experience with wind power, the capacity for wind energy in Colorado, and the fact that Xcel Energy, the largest energy provider in Colorado, is the utility with the most wind power on the system, the scenario presented in the RFD scenario seems inappropriately skewed toward solar energy.

Nevada

- *Approximately 67% of the state is BLM land, 48 million acres*

In Nevada close to 40% of the RFD scenario estimate has already been approved for development on BLM-administered land. However, close to 30% of the currently proposed solar energy is on private land: three projects totaling 634 MW. Some of the solar projects being developed in Nevada, moreover, may serve California's RPS. For example, if developed, the 457 MW El Dorado project in Clark County would count toward California's RPS goals, rather than Nevada's. Additionally, NV Energy continues to focus on geothermal as the primary renewable energy to achieve the Nevada RPS goals.

New Mexico

- *Approximately 17% of the state is BLM land, 13.4 million acres*

The diversity requirement for New Mexico mandates 20% from solar, which conceivable could justify a higher RFD scenario for the state. However, the estimate of solar development on BLM land is consistent with current development patterns. More specifically, the New Mexico utilities get most of their solar from smaller projects or from projects that go through a third-person provider which are not currently located on BLM land.

Utah

- *Approximately 42% of the state is BLM-administered land, 22.9 million acres*

Given that the Utah RPS is voluntary, it is probable that less solar development will occur on BLM-administered lands than estimated. Currently, there are no proposed solar projects on BLM-administered land. Additionally, the Utah PUC indicated that the solar that was proposed and/or built were smaller projects, often coinciding with public facilities such as schools.

Additional Background on RFDS Issues

Transmission Constraints

As noted in the CPUC 33% Renewables Portfolio Standard Implementation Analysis Preliminary Results (June 2009), transmission planning, permitting, and construction has been

and may continue to be a challenge to achieving 33% renewables by 2020. The report concluded that to meet the 33% RPS goals, seven transmission lines would be required in addition to four new transmission lines required to achieve a 20% RPS. The zonal approach will facilitate transmission planning and permitting to achieve RPS goals: clustering projects in zones will help prioritize needed transmission and, indeed, the basic outlines of the zones in California that are analyzed in the PEIS in California were drawn by the state's Renewable Energy Transmission Initiative, a voluntary, multi-stakeholder process, as part of a major effort to facilitate transmission planning and permitting of the lines necessary to achieve those goals.

Contract Failure

Contract failure has been noted in reports to the California Energy Commission and California Public Utilities Commission as a difficulty in reaching the RPS goals. The rate of contract failure and/or project viability has been addressed as follows:

- Between 2002 and 2011 a total of 27 of the 219 RPS contracts approved or under review (approximately 12%) were terminated (CPUC, Progress Towards California's Renewables Portfolio Standard Goals, Senate Oversight Hearing Feb 1, 2011)
- Utilities should expect a minimum overall contract failure rate of 20 to 30% (Consultant Report for the California Energy Commission, January 2006)
- Of the overall sample used in the report, 54% were categorized as "successful", either online or scheduled to meet online date, 23% were canceled, 14% were delayed, and 9% were in default (Consultant Report for the California Energy Commission, January 2006).
- According to the Database of Investor-Owned Utilities' Contracts for Renewable Generation, Contracts Signed Toward Meeting the California RPS Targets (August 2010), 15% of the contracts signed have been canceled, 21% are delayed, and 64% are on track.
- Top causes of contract failure included siting and permitting issues, developer financial troubles, capital cost increases, and transmission and interconnection issues.
- According to the RPS Status Report Q4 2010, existing RPS contracts should achieve the 2010 20% RPS mandate in 2012 with projects that are online or viable at more than 90%[54] (see Figure 2: Risk Profile of Executed RPS Contracts). To achieve 33% renewable energy by 2020, approximately 20,000 MW of executed RPS contracts that are less than 90% viable, some as low as 50 percent viable, would be necessary.

Permitting Constraints

The permitting processes for utility scale solar projects in California during 2009 and 2010 were completed remarkably quickly, removing the developers' earlier challenges to agencies' abilities to issue permits for these large projects in an expeditious manner. However, it remains to be seen whether the approvals and permits issued will stand up to the current legal challenges. BLM and other responsible agencies should look carefully at the legal challenges to the 2010 decisions and consider whether the NEPA process for future projects requires more time and attention.

[54] The CPUC Project Viability Calculator includes project development experience, ownership/O&M experience, technical feasibility, resource quality, manufacturing supply chain, site control, permitting status, project financing status, interconnection progress, transmission requirements, and reasonable of commercial online date

Sources

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http://geology.utah.gov/emp/energydata/renewenergydata.htm

Appendix I

Attachments to Appendix I

	2011 RENEWABLE ENERGY ACTION TEAM - GENERATION TRACKING FOR RENEWABLE PROJECTS							
	Revised 12/31/2010							
	Project Name	County	Developer	ID	Cap. (MW)	Type	Lead Agency	DOE Guarantee
2011 Priority Projects								
	Solar							
1	First Solar Kern	Kern	First Solar	CACA 48820	745	Solar PV	BLM	
2	Maricopa Sun Solar Complex	Kern	Granville Homes	GPA 5, CUP 5,	700	Solar PV	Kern County/DFG/USF	Yes.
3	Antelope Valley Solar	Kern	Renewable Resources		650	Solar PV	Kern County	
4	Quartzite	Riverside	First Solar	CACA 49397	600	Solar PV	BLM	ROD target 2012
5	Desert Sunlight	Riverside	First Solar	CACA 48649	550	Solar PV	BLM	ROD target 2011
6	Topaz Solar Farm	San Luis Obispo	First Solar	DRC2008-000	550	Solar PV	San Luis Obispo County	
7	Sunpeak Solar	Imperial	Superstition Solar	CACA 49150	500	Solar PV	BLM	ROD target 2012
8	Palen	Riverside	Solar Millennium, LLC	CACA 48810	484	Solar Thermal	BLM	ROD target 6/2011
9	Solargen Panoche Valley Sola	San Benito	Solargen	CUP 1023-09	399	Solar PV	San Benito County	No.
10	Stateline	San Bernardino	First Solar	CACA 48669	380	Solar PV	BLM	ROD target 2012
11	Caithness Soda Mtn, LLC	San Bernardino	Caithness Soda Mtn,	CACA 49584	350	Solar PV	BLM	ROD target 2012
12	McCoy	Riverside	NextEra	CACA 48728	250	Solar PV	BLM	ROD target 2012
13	California Valley Solar Ranch	San Luis Obispo	Sun Power	DRC2008-000	210	Solar PV	San Luis Obispo County/DFG	
14	Chocolate Mountains Solar F	Imperial	8 Minute Energy		50	Solar PV	Imperial County	Yes.
15	Calipatria Solar Farm II	Imperial	8 Minute Energy		50	Solar PV	Imperial County	Yes.
16	Lucerne Valley Solar	San Bernardino	Chevron, Fotowatio R	CACA 49561	45	Solar PV	CDFG	
17	High Plains Ranch III	San Luis Obispo	SunPower		40	Solar PV	San Luis Obispo County	Yes.
18	Ocotillo Sol	Imperial	SDG&E	CACA 51625	14	Solar PV	BLM	ROD target 2011
19	Cantil Solar Project	Kern	Nautilus Solar LLC		9	Solar PV	Kern County	Yes.
20	North Muroc	Kern	Nautilus Solar LLC		9	Solar PV	Kern County	Yes.
					6,585			
	Wind							
21	Ocotillo Express	Imperial	Pattern Energy Group	CACA 51552	560	Wind	BLM	ROD target 12/2011
22	Iberdrola Tule Wind	San Diego	Pacific Wind, LLC	CACA 49698	200	Wind	BLM	ROD target 7/2011
23	AES Daggett Ridge	San Bernardino	AES Wind Genergatio	CACA 49575	84	Wind	BLM	

24	Granite Wind, LLC	San Bernardino	RES North America	CACA 48254	74	Wind	BLM	
25	Walker Ridge	Lake and Colusa	Alta Gas REP	CACA 51667	70	Wind	BLM/DFG	ROD target 11/2011
26	Invenergy Horse Lake	Lassen	Invenergy	CACA 49709	51	Wind	BLM	ROD target 12/2011
27	Rising Tree	Kern	Rising Tree Wind, LLC	CACA 52363	234	Wind	BLM/Kern County	ROD target 12/2011
					1,273			
	Geothermal							
28	Black Rock Geothermal 1,2, a	Imperial	CalEnergy Obsidian Er	2002-AFC-02	159	Geothermal	CEC	No.
29	East Brawley - Ormat	Imperial	Ormat		49	Geothermal	Imperial County	Yes.
30	Wister - Ormat	Imperial	Ormat		49	Geothermal	Imperial County	Yes.
31	Casa Diablo Geothermal	Mono	Casa Diablo Geotherm	CACA 11667,	40	Geothermal	USFS/BLM	
					297			
					8,155			
Other 2011 Projects								
	Solar							
32	Power Partners Southwest	San Bernardino	EnXco	CACA 49585	1,000	Solar PV	BLM	
33	Brightsource	Riverside	Brightsource		750	Solar Thermal	CEC	No
34	Brightsource	Inyo	Brightsource		500	Solar Thermal	CEC	No
35	Trilobite	San Bernardino	PG&E	CACA 49432	500	Solar Thermal	CEC/BLM	
36	Fort Irwin Solar Energy EUL	San Bernardino	Clark-Acciona		500	Solar Thermal	CEC/ARMY	
37	Ogilby Solar	Imperial	Iberdrola Renewables	CACA 49615	450	Solar Thermal	CEC/BLM	No
38	Oro Verde Solar (Edwards AF	Kern	Fotowatio Renewable Ventures		450	Solar PV	USAF	
39	Gateway Solar Project	Kern	East Kern Properties, LLC		350	Solar PV	Kern County	
40	EnXco I	Riverside	EnXco Development	CACA 49488	300	Solar PV	BLM	
41	EnXco III	Riverside	EnXco Development	CACA 49490	300	Solar PV	BLM	
42	EnXco IV	Riverside	EnXco Development	CACA 49491	300	Solar PV	BLM	
43	Iberdrola Renewables	San Bernardino	Iberdrola Renewables	CACA 49813	300	Solar Thermal	CEC/BLM	
44	Cadiz Lake	San Bernardino	Iberdrola Renewables	CACA 49430	300	Solar Thermal	CEC/BLM	
45	Sunpower Kern/LA1	Kern/LA	Sunpower		250	Solar PV	Kern/LA	
46	Sunpower Kern/LA3	Kern/LA	Sunpower		219	Solar PV	Kern/LA	
47	Chuckwalla Solar	Riverside	Chuckwalla Solar LLC	CACA 48808	200	Solar PV	BLM	
48	Mount Signal Solar Farm I	Imperial	8 Minute Energy		200	Solar PV	Imperial County	No.
49	Sunpower Kern/LA2	Kern/LA	Sunpower		181	Solar PV	Kern/LA	
50	Willow Springs Solar Array	Kern	First Solar	CUP 26, Map	160	Solar PV	Kern County	

51	Midway Solar Farm II	Imperial	8 Minute Energy		155	Solar PV	Imperial County	No.
52	Ward Valley	San Bernardino	Solar Reserve, Leopol	CACA 49002	150	Solar Thermal	CEC/BLM	No
53	Great Valley	Kern	Element Power	CACA 51812	150	Solar PV	BLM	
54	Leo Solar	Merced	Fotowatio Renewable Ventures		150	Solar PV	Merced County	
55	Sunpower Central Valley Q2	Unk	Sunpower		138	Solar PV	Unk	
56	Centinela Solar Energy Facilit	Imperial	LS Power		130	Solar PV	Imperial County	
57	Rosamond Solar Project	Kern	SGS Antelope Valley	0	120	Solar PV	Kern County	
58	US Solar Holdings Riverside	Riverside	US Solar Holdings	PP24616	100	Solar PV	Riverside County	
59	Salton Sea Solar Farm II	Imperial	8 Minute Energy		100	Solar PV	Imperial County	No.
60	Imperial Solar Energy Center	Imperial	Solar Reserve, LLC	CACA 49884	100	Solar Thermal	CEC/BLM	
61	El Mirage	San Bernardino	Axio Power Holdings		90	Solar PV	San Bernardino County	
62	Cygnus Solar	Kern	Fotowatio Renewable Ventures		80	Solar PV	Kern County	
63	Regulus	Kern	Fotowatio Renewable Ventures		80	Solar PV	Kern County	
64	Colgreen Energy	Riverside	Colgreen Energy	CUP03635	75	Solar PV	Riverside County	
65	Weldon Solar Project	Kern	Renewable Resources	ZCC 3, CUP 1,	60	Solar PV	Kern County	
66	Sunpower Kern W1	Kern	Sunpower		60	Solar PV	Kern County	
67	Calipatria Solar Farm I	Imperial	8 Minute Energy		50	Solar PV	Imperial County	TBD
68	Midway Solar Farm I	Imperial	8 Minute Energy		50	Solar PV	Imperial County	No.
69	Salton Sea Solar Farm I	Imperial	8 Minute Energy		50	Solar PV	Imperial County	No.
70	Alpaugh Solar	Tulare	Solar Project Solution	PSP 10-030	50	Solar PV	Tulare or Kings	
71	US Solar Borrego One	San Diego	NRG Borrego Solar One, LLC		46	Solar PV	San Diego County	
72	Lightsource Renewables, LLC	San Bernardino	Lightsource Renewables, LLC		40	Solar PV	San Bernardino County	
73	Tehachapi Photovoltaic Proje	Kern	GE Energy by URS Corp		40	Solar PV	Kern County	
74	Borrego Solar Farm	San Diego	Eurus Energy	CASE NUMBE	45	Solar PV	San Diego County	No
75	Orion Solar	Kern	Fotowatio Renewable Ventures		40	Solar PV	Kern County	
76	SR Solis Vestal Herder	Tulare	SolarGen USA, LLC	PSP 10-017 SR	18	Solar PV	Tulare County	TBD
77	Ridge Rider Solar Park	Kern	Global Real Estate Investment Partn		38	Solar PV	Kern County	
78	Sunpower Central Valley 1	Unk	Sunpower		30	Solar PV	Unk	
79	Sunpower Tribal	Unk	Sunpower		30	Solar PV	Unk	
80	Granite Construction I	Tulare	SolarGen USA, LLC		30	Solar PV	Tulare County	TBD
81	GWF Tracy Amendment	San Joaquin	GWF Tracy		30	Solar PV	CEC	
82	Split Mountain Solar Farm	San Diego	EnXco		26	Solar PV	San Diego County	
83	Imperial Valley Solar Co. I	Imperial	Imperial Valley Solar Co.		23	Solar PV	Imperial County	

84	Smyrna Solar	Kern	EnXco	CUP 5, Map 7	20	Solar PV	Kern County	
85	Mojave Solar 1	Kern	Fotowatio Renewable Ventures		20	Solar PV	Kern County	
86	Mojave Solar 4	Los Angeles	Fotowatio Renewable Ventures		20	Solar PV	Los Angeles County	
87	Rosamond I	Kern	Recurrent Energy		20	Solar PV	Kern County	
88	Rosamond II	Kern	Recurrent Energy		20	Solar PV	Kern County	
89	Porter and Associates	Kern	Porter and Associates		20	Solar PV	Kern County	
90	Tehachapi	Kern	Recurrent Energy		20	Solar PV	Kern County	
91	Columbia II	Kern	Recurrent Energy		20	Solar PV	San Bernardino County	
92	DTE Energy I	Tulare	DTE Energy	PSP 09-077	20	Solar PV	Tulare County	No
93	DTE Energy II	Tulare	DTE Energy	PSP 09-078	20	Solar PV	Tulare County	No
94	Element Power I	Tulare	Element Power	PPA 10-002	20	Solar PV	Tulare County	
95	SR Solis Terra Bella	Tulare	SolarGen USA, LLC	PSP 10-016	20	Solar PV	Tulare County	TBD
96	SR Solis Mouren 3	Fresno	SolarGen USA, LLC		20	Solar PV	Fresno County	TBD
97	SR Solis City of Gustine	Merced	SolarGen USA, LLC		20	Solar PV	Merced County	TBD
98	SR Solis City of McFarland	Kern	SolarGen USA, LLC		20	Solar PV	Kern County	TBD
99	Cal S.P. IV, LLC	Tulare	Cal S.P. IV, LLC	PSP 10-039	20	Solar PV	Tulare County	No
100	White River	Tulare	Solar Project Solutions (SPS)		20	Solar PV	Tulare County	
101	Corcoran	Tulare	Solar Project Solutions (SPS)		20	Solar PV	Kings County	
102	Alpaugh North	Tulare	Solar Project Solution	PSP 10-029	20	Solar PV	Tulare	
103	Victor Phelan Solar One	San Bernardino	Recurrent Energy		20	Solar PV	San Bernardino County	
104	LSR Kramer South	San Bernardino	LSR Kramer South		20	Solar PV	San Bernardino County	
105	North Edwards Solar	San Bernardino	North Edwards Solar		20	Solar PV	San Bernardino County	
106	Old River I	Kern	Recurrent Energy		20	Solar PV	Kern County	
107	SR Solis Oro Loma	Fresno	SolarGen USA, LLC		19	Solar PV	Fresno County	TBD
108	SR Solis Oro Loma Teresina	Fresno	SolarGen USA, LLC		19	Solar PV	Fresno County	TBD
109	SR Solis Vestal Fireman	Tulare	SolarGen USA, LLC	PSP 10-054	19	Solar PV	Tulare County	TBD
110	SR Solis Vestal Almond	Tulare	SolarGen USA, LLC	PSP 10-015	18	Solar PV	Tulare County	TBD
111	SR Solis Lucas	Tulare	SolarGen USA, LLC		18	Solar PV	Tulare County	TBD
112	SR Solis Mouren 2	Fresno	SolarGen USA, LLC		18	Solar PV	Fresno County	TBD
113	SR Solis Avenal	Kings	SolarGen USA, LLC		18	Solar PV	Kings County	TBD
114	Goose Lake Solar	Kern	EnXco	CUP7 Map 53	15	Solar PV	Kern County	
115	Newberry Springs, Lucerne V	San Bernardino	First Solar		15	Solar PV	San Bernardino County	
116	SR Solis Crown	Tulare	SolarGen USA, LLC	PSP 10-058	15	Solar PV	Tulare County	TBD

117	SR Solis Borden	Tulare	SolarGen USA, LLC		15	Solar PV	Tulare County	TBD
118	SR Solis Yancey Farms	Merced	SolarGen USA, LLC		15	Solar PV	Merced County	TBD
119	Southwestern Solar Power II	Riverside	Southwestern Solar	PP24680	13	Solar PV	Riverside County	
120	SR Solis Rector	Tulare	SolarGen USA, LLC	PSP 10-059	10	Solar PV	Tulare County	TBD
121	Columbia III	Kern	Recurrent Energy		10	Solar PV	Kern County	
122	TA-High Desert	Los Angeles	TA-High Desert		10	Solar PV	Los Angeles County	
123	Elk Hills Solar	Kern	EnXco	CUP16, Map 1	7	Solar PV	Kern County	
124	SR Solis Firebaugh	Fresno	SolarGen USA, LLC		7	Solar PV	City of Firebaugh	TBD
125	SR Solis East Reedley	Fresno	SolarGen USA, LLC		7	Solar PV	Fresno County	TBD
126	San Bernard Solar	Kern	EnXco	CUP 5, Map 1(	6	Solar PV	Kern County	
127	Great Lakes	Kern	Recurrent Energy		6	Solar PV	Kern county	
128	SR Solis City of Huron	Fresno	SolarGen USA, LLC		5	Solar PV	Fresno County	TBD
129	SR Solis Mouren 1	Fresno	SolarGen USA, LLC		5	Solar PV	Fresno County	TBD
130	SR Solis Gonzalez	Kern	SolarGen USA, LLC		5	Solar PV	Kern County	TBD
131	Rio Grande	Kern	Recurrent Energy		5	Solar PV	Kern County	
132	Southwestern Solar Power I	Riverside	Southwestern Solar	PP24682	5	Solar PV	Riverside County	
133	Avenida Del Sol Solar Project	Kern	Avenida del Sol Solar		5	Solar PV	Kern County	
134	Old River II	Kern	Recurrent Energy		5	Solar PV	Kern County	
135	Amonix Borrego Solar	San Diego	Avalon Solar, LLC		2	Solar PV	San Diego County	
136	Avalon Riverside	Riverside	Avalon Solar, LLC	PP24670	2	Solar PV	Riverside County	
137	Temescal Canyon RV, LLC	Riverside	Temescal Canyon RV,	PP24075R1	2	Solar PV	Riverside County	
138	Ormat Solar PV I	Imperial	Ormat		Unk	Solar PV	Imperial County	No.
139	Ormat Solar PV II	Imperial	Ormat		Unk	Solar PV	Imperial County	No.
140	Ormat Solar PV III	Imperial	Ormat		Unk	Solar PV	Imperial County	No.
141	Ormat Solar PV IV	Imperial	Ormat		Unk	Solar PV	Imperial County	No.
					10,365			
	Wind							
142	Avalon I	Kern	EnXco		610	Wind	Kern County	
143	North Sky River Energy, LLC (	Kern	NextEra	CACA 52348	300	Wind	Kern County/BLM	
144	Oak Creek Sun Creek	Kern	TerraGen	CACA 44611	300	Wind	BLM	
145	Manzana Wind Project	Kern	PG&E	CPCN A.09-12-(	246	Wind	Kern County/CPUC	
146	Shiloh III	Solano	EnXco		200	Wind	Solano County	
147	Camp Rock	Kern	Horizon Wind	CACA 51605	150	Wind	Kern County/BLM	

148	Whitewater Hill	Riverside	Shell Cabazon		105	Wind	Riverside County	
149	Windswept	Kern	Western Wind Energy Corp.		72	Wind	Kern County	
150	Tylerhorse Wind	Riverside	Power Partners South	CACA 51561	60	Wind	BLM	
151	Sand Canyon of Tehachapi	Kern	Sand Canyon of Tehachapi		40	Wind	Kern County	
152	Clear Vista Ranch Wind	Kern	Clear Vista Ranch		20	Wind	Kern County	
153	Avalon/Catalina	Riverside	Power Partners South	CACA 52309	15	Wind	BLM	
154	Lower West Wind Energy Pro	Kern	AERO Energy LLC		14	Wind	Kern County	
155	Coram ZC 60	Kern	Coram Development		6	Wind	Kern County	
156	Shiloh IV	Solano	EnXco		Unk	Wind	Solano County	
157	Sand Ridge	San Bernardino	AES Wind Generation	CACA 50612	Unk	Wind	BLM	
158	Black Mountain	Imperial	Imperial Wind RES	CACA 48272	Unk	Wind	BLM	
159	Soledad Mountain Wind	Kern	Oak Creek Energy	CACA 48536	Unk	Wind	BLM	
160	Pattern Energy Wind	Imperial	Pattern Energy		Unk	Wind	Imperial County	
161	Invenergy, LLC	Modoc	Invenergy, LLC	CACA 48110	Unk	Wind	BLM	
					2,138			
	Geothermal							
162	Black Rock 4, 5, 6	Imperial	CalEnergy Obsidian Energy, LLC		159	Geothermal	CEC	No.
163	Black Rock 7, 8, 9	Imperial	CalEnergy Obsidian Energy, LLC		159	Geothermal	CEC	No.
164	West Chocolate Geothermal	Imperial	Ormat	CACA 43965	50	Geothermal	CEC/BLM	
165	Hudson Ranch II	Imperial	Hudson Ranch		49	Geothermal	Imperial County	
166	East Brawley Iceland America	Imperial	Iceland America, LLC		49	Geothermal	Imperial County	
167	South Brawley	Imperial	Iceland America, LLC		49	Geothermal	Imperial County	
168	IAE Truckhaven I	Imperial	Iceland America, LLC		49	Geothermal	Imperial County	
					564			
	Other Technologies							
169	Eagle Mountain Pumped Stor	Riverside	Eagle Crest		1,300	Pumped Stora	FERC/BLM	
170	El Dorado Irrigation District	El Dorado	El Dorado Irrigation District		21	Small hydro	FERC	
171	Sunshine Landfill	Los Angeles	DTE		20	Landfill Gas	Los Angeles County	
172	Portrero Hills Landfill	Solano	DTE		8	Landfill Gas	Solano County	
					1,349			
					14,416			
					22,571			

	Transmission Lines							
1	Rice Solar Transmission Line	San Bernardino	Solar Reserve, LLC	CACA 51022	161 kV	Gen-tie from Sc	BLM	Yes ROD 6/2011
2	Centinela Solar	Imperial	Lightsource Renewables	CACA 52092	230 kV	Gen-tie from Sc	BLM	
3	C Solar South	Imperial	LIghtsource Renewables	CACA 51645	230 kV	Gen-tie from Sc	BLM	
4	C Solar West	Imperial	Lightsource Renewables	CACA 51644	230 kV	Gen-tie from Sc	BLM	
5	Abengoa telecommunications	San Bernardino	SCE		fiber opt	Abengoa	BLM	
6	Colorado River Substation and l	Riverside	SCE	CACA 48771	500 kV	Transmission Li	BLM/CPUC	
7	Barren Ridge Transmission Line	Kern & Los Angeles	LADWP	CACA 48871	230 kV	Transmission Li	BLM/LADWP	
8	Ivanpah to El Dorado Transmiss	San Bernardino	SCE	CACA 49834	230 kV	Transmission Li	BLM/CPUC	
9	Red Bluff Loop in DPV2	Riverside	SCE		500/230	Needed for Pal	CPUC	
10	Red Bluff Substation and Loop i	Riverside	SCE		500/230	Needed for Des	CPUC	
11	West of Devers Upgrades	Riverside	SCE		500 kV	Needed for Ge	BLM/CPUC	
12	Pisgah Substation	San Bernardino	SCE		500/230	Calico	BLM/CPUC	
13	Pisgah to Lugo rebuild	San Bernardino	SCE		500 kV	Calico	BLM/CPUC	
14	Calico telecommunications	San Bernardino	SCE		fiber opt	Calico	CPUC	
15	Coolwater to Lugo rebuild	San Bernardino	SCE		230 kV	Abengoa	BLM/CPUC	
16	Lockhart Substation and loop in	San Bernardino	SCE		230 kV	Abengoa	CPUC	
17	ECO substation	Imperial	SDG&E		500/230	Tule Wind and	CPUC	
18	Morro Bay to Gates reconducto	San Luis Obispo	PG&E		115 kV	Carizzo Plain pr	CPUC	
19	Walker Ridge	Lake and Colusa	PG&E					
20	Path 42	Unk	SCE/IID					
21	Borden to Gregg	Unk	PG&E					

Attachment 2 to Appendix 1: Renewable Portfolio Standards Data (for analysis of Solar Energy Development PEIS)

RPS satisfied for compliance year 2009?	Yes	No	Yes	Yes	Yes	N/A
How is RPS satisfied?	• Met 2009 compliance year target • On target to meet 2010 compliance year target	• Slightly under 50% of RPS goal. • IOUs have more renewable electricity under contract than needed to achieve 33% RPS target but anticipate that not all this energy will come on line	• PSC expects to meet or exceed RPS requirements by 2020.	• Slightly under 50% of RPS goal. • Likely to achieve RPS assuming sufficient transmission between north of the state (geothermal) and south of the state (biggest load centers)	• Approximately 25% of RPS goal achieved	• Approximately 5% of goal achieved but RPS is voluntary
RPS Satisfied by currently proposed projects?	• More than satisfied	• More than satisfied	• No (but minimal information is available regarding proposed projects)	• More than satisfied	• More than satisfied	• No
Renewable Energy capacity online (data from State PUC or individual provider information)	• Total: 20 MW (but does not include APS) • SSVEC: 3.1MW • Tucson Electric Power: 9.9 MW (utility scale) and 3.1 MW DG • UniSource Energy Services: 2.2 MW • AZ Electric Power Cooperative: 1.6 MW solar, .1 MW wind, 49 solar water heaters w/ 140 kW energy savings	• Total: 1,702 MW	• Total: 1224.5 MW • Wind: 1200 MW • Solar: 24.5 MW	• Total: 418.2 MW • Geothermal: 315 • Solar: 79.3 • Biomass/Methane: 12.4 • Hydro: 11.5		• Total: 570.7 MW • Biomass: 7.8 MW • Geothermal: 50.1 MW • Solar: 1.5 MW • Wind 224.8 MW • Hydro: 286.5 MW
Renewable Energy online (data from State PUC or individual provider information) MWh	APS: 653,800 MWh				PNM: 525,000 MWh (wind)	1,069,876 MWh (primarily hydro)

Attachment 3 to Appendix 1: Renewable Portfolio Standards Data (for analysis of Solar Energy Development PEIS)

Renewable Energy Net Generation by State by source (MWh)[7] n/d = No data reported	Total: 182,960 MWh • Biomass: 159,645 MWh • Geothermal: - • Solar Thermal/PV: 13,759 MWh • Wind: 9,555 MWh	Total: 25,461,867MWh • Biomass: 6,062,631 MWh • Geothermal: 13,022,836 MWh • Solar Thermal/PV: 611,763 MWh • Wind: 5,764,637 MWh	Total: 3,009,191 MWh • Biomass: 50,528 MWh • Geothermal: - • Solar Thermal/PV: 16,530 MWh • Wind: 2,942,133 MWh	Total: 1,768,426 MWh • Biomass: 890 MWh • Geothermal: 1,616,677 MWh • Solar Thermal/PV: 150,858 MWh • Wind: n/d	Total: 1,561,148 MWh • Biomass: 17,433 MWh • Geothermal: - • Solar Thermal/PV: - • Wind: 1,543,715 MWh	Total: 372,884 MWh • Biomass: 696,991 MWh • Geothermal: 279,121 MWh • Solar Thermal/PV: - • Wind: 64,497 MWh

APPENDIX II. ANALYSIS OF PREFERABLE LEGAL INSTRUMENT FOR ADMINISTERING SOLAR ENERGY PROGRAM

In Appendix A of the Draft Solar Programmatic Environmental Impact Statement (DPEIS), the Bureau of Land Management (BLM) details current and proposed solar energy development policies and design features. In part A.2.1.2 of Appendix A, Proposed Authorizations Policies to be applicable to all future and existing solar energy applications as part of the "Proposed Solar Energy Program" are listed, with part A.2.1.2.4 specifically concerning "ROW Authorization." However, a critical element is not addressed in this section of the DPEIS, that of the appropriateness of using BLM's current right-of-way (ROW) system for permitting solar projects rather than a lease. If BLM proposes to continue operating under its current leasing framework in the Proposed Solar Energy Program, it must demonstrate how a ROW grant is legally and programmatically preferable to a lease.

BLM currently offers solar energy project permits with a ROW grant, as authorized under Title V of the Federal Land Policy and Management Act (FLPMA) and in accordance with Title 43, Part 2800 of the Code of Federal Regulations (CFR). Instruction Memoranda 2007-097, 2010-141, and 2011-003 specify further guidance for permitting, assessing rental fees, terms of the authorization, and other features of ROW applications. BLM recommends in the PEIS that utility-scale solar energy projects on public lands continue under the current model: authorizing ROW permits for terms not to exceed 30 years.

Sufficiency in question of ROW grants in place of leases for solar energy projects

BLM must use the Final PEIS to demonstrate that ROW grants are the most legally-adequate and fiscally-sound documents for permitting solar energy projects on public lands. Current statutes, guidance, and case law seem to suggest otherwise, that leases not only have more precedent for permitting energy projects, but are more appropriate for legal and fiscal reasons.

Because legislation has not been enacted to establish a formal solar energy program at BLM, the agency has relied on permitting projects with ROW grants under its FLPMA multiple use authority, even though FLPMA and additional regulations do not specifically speak to solar projects. For this reason, BLM has promulgated a series of Instruction Memoranda to clarify the use of FLMPA for processing ROW permits for solar projects.

The more traditional legal document for permitting energy projects on public lands, and used for all forms of energy development besides hydropower and wind, is a lease. Leasing is also the traditional legal instrument for conveying commercial energy development rights on private lands.

Pursuant to Title 43, Part 2920 of the CFR, a lease is defined as an "authorization to possess and use public lands for a fixed period of time."[55] Alternatively, leases "shall be used to authorize uses of public lands involving substantial construction, development, or land improvement and the investment of large amounts of capital which are to be amortized over time."[56]

[55] http://edocket.access.gpo.gov/cfr_2003/octqtr/pdf/43cfr2920.0-1.pdf
[56] http://edocket.access.gpo.gov/cfr_2003/octqtr/pdf/43cfr2920.1-1.pdf

The first issue with using ROW authorizations over leases is their appropriateness for long-term renewable energy projects. ROW grants have traditionally been utilized for permitting a *use* of the lands, rather than the commercial *development of a resource* emanating from those lands. Commercial development of energy and other natural resources have historically been managed with leases that include specific terms and conditions to govern that development. As noted by a former career attorney with the Congressional Research Service (CRS), this distinction makes the ROW legal instrument "a bad fit" for solar energy projects.[57]

It is important to note that ROW grants are legally-effective decisions that are effective during any appeals, but that significant inadequacies remain. Because ROW grants were not intended to permit long-term, large-scale solar energy projects, or any energy project for that matter, their legal adequacy is called in to question. And, the fact that BLM is forced to rely on FLPMA ROW regulations plus a set of clarifying Instruction Memoranda further proves the insufficiency of this instrument for commercial energy purposes.

Secondly, as described in a recent report by the CRS, "the most significant difference between leases and rights-of-way are the substantial rights to use of the land in question retained by the lessor, the United States."[58] This is because, according to Title 43, Part 2920 of the CFR, "A lease conveys a possessory interest and is revocable only in accordance with its terms and the provisions of…this title." On the other hand, BLM retains many rights under a ROW authorization, including access to lands and facilities, requiring common use of the land, ability to deny renewal of the grant, authority to change the terms and conditions of the grant "as a result of changes in legislation or regulation or as otherwise necessary to protect public health or safety or the environment."[59] Companies have fewer legal rights under a ROW permit than they would with a lease, as leases are more flexible, established, and allow for significant input from developers.

Also problematic is the fact that FLPMA ROW regulations and the clarifying solar energy Instruction Memoranda fall short of laying out clear requirements and standards for projects, which "may result in significant variation in individual wind and solar project authorizations and call into question the reviewability of those authorizations."[60] ROW permits do not provide the certainty needed to solar energy developers.

Additionally, the Proposed Solar Energy Program's reliance on ROWs, Instruction Memoranda, and project-by-project National Environmental Policy Act analyses avoids critical and legally-mandated public participation in the development of solar energy programs and projects. The development and promulgation of a legal framework for a solar energy program at BLM (of which an analysis of ROWs and leases would be a part) would provide significant opportunity

[57] Baldwin, Pamela. "Fair Market Value for Wind and Solar Development on Public Land." November 1, 2010. [57] http://wilderness.org/files/Fair-Market-Value-Whitepaper.pdf
[58] Vann, Adam. "Energy Projects on Federal Lands: Leasing and Authorization." Congressional Research Service. September 8, 2009. http://assets.opencrs.com/rpts/R40806_20090908.pdf
[59] Vann, Adam. "Energy Projects on Federal Lands: Leasing and Authorization." Congressional Research Service. September 8, 2009. http://assets.opencrs.com/rpts/R40806_20090908.pdf
[60] Baldwin, Pamela. "Fair Market Value for Wind and Solar Development on Public Land." November 1, 2010. http://wilderness.org/files/Fair-Market-Value-Whitepaper.pdf

for public comment. At this point, decisions about the solar energy program at BLM are undertaken unilaterally by the agency via Instruction Memoranda, and no other federal agencies, public groups, or other stakeholders are able to take part in the decision-making . As one author noted, "This closing out of the public is a departure from the usual federal land management approach and will curtail useful input and concerns."[61]

[61] Baldwin, Pamela. "Fair Market Value for Wind and Solar Development on Public Land." November 1, 2010. http://wilderness.org/files/Fair-Market-Value-Whitepaper.pdf

APPENDIX III. ANALYSIS OF PROPOSED POLICY ELEMENTS IN APPENDIX 2

Location in PEIS	Details	In existing guidance?	If so, which?	Critique
A.2.1.2.1.1	The BLM authorized officer will schedule a pre-application meeting with developers to explain BLM's Solar Energy Program and to identify potential issues and land use conflicts (43 CFR 2804.10).	Yes	IM 2011-061	
A.2.1.2.2.1	The BLM will review applications for land use plan conformance (43 CFR 1610.5-3).	Yes	Required by regulation, reaffirmed and strengthened in IM 2011-061	This should be existing policy as it is required by regulation. What is sorely lacking is predictability in terms of a time frame for when this test gets applied; Land use plan conformance should be evaluated during pre-application meetings and project proponents should be clearly informed in those discussions that • applications that are not consistent with underlying land use plans will not be accepted OR • applications that are not consistent with underlying land use plans will be rejected upon receipt as inconsistent with agency regulation

A.2.1.2.2.2	Entities seeking to develop a solar energy project on BLM-administered lands shall coordinate with potentially affected/appropriate federal agencies (e.g., USFWS, NPS), in conjunction with BLM staff, regarding specific projects as early in the project development process as appropriate to ensure that all issues and concerns (e.g., Migratory Bird Treaty Act [MBTA], Bald and Golden Eagle Protection Act [BGEPA], potential impacts on National Park resources) are identified and to ensure that there is potential for those issues to be adequately addressed.	Yes	Recommended, not required, in IM 2011-003	§This is a principle not a policy statement that is not already in prevailing ROW policies (eg, Manual); Language is appealing but would accomplish little without greater specificity to guide field staff implementing these provisions• 'early in the project development process as appropriate' does little to provide developers predictability required for rational development• Provisions do not clearly link to the specific prevailing statute, regulation, regulation, policy, or guidelines that would apply, offering little new information to parties including field staff§ Presumption here is that all applications are worthy of review, which should not be the case
A.2.1.2.2.3	Entities seeking to develop a solar energy project on BLM-administered lands shall also coordinate with the U.S. Department of Defense (DoD), in conjunction with BLM staff, regarding the location of solar power tower projects early in the application process…An interagency protocol will be developed to establish a coordination process and the scope of issues to be addressed by such coordination.	Yes	Recommended, not required, in IM 2011-003. Interagency protocol not addressed.	Coordination with DOD is to be lauded but need clear timeframes for when DOD coordination is to occur and tie to progression through NEPA review
A.2.1.2.2.4	Entities seeking to develop a solar energy project on BLM-administered lands shall coordinate with appropriate state agencies and local land managers, in conjunction with BLM staff, regarding specific projects as early in the project development process as appropriate to ensure that all issues and concerns are identified and that there is potential for those issues to be adequately addressed.	Yes	Recommended, not required, in IM 2011-003	Establish timeframes for engagement and tie to progression through NEPA review; RECOMMEND establishing a single point of contact for each zone to facilitate this engagement pre-application

A.2.1.2.2.5	Entities seeking to develop a solar energy project on BLM-administered lands shall contact the owner of any federal mining claim located with the boundaries of the proposed solar energy project, in conjunction with BLM staff, to ensure that there is a potential for resolving any conflicts with federal mining claims.	Yes/No	IM 2011-061 requires pre-application meetings to Identify other existing authorized uses, but mining not specifically mentioned.	Zone-based development would not require this additional step, saving time and scarce resources; As long as the BLM does not have a time-bounded process, segregation of lands for this purpose could be an indefinite withdrawal only feeding the speculative behavior the agency and most developers have said it wants to dampen
A.2.1.2.2.6	The BLM will determine whether the lands included in the proposed solar energy project should be segregated from appropriation under the public land laws, including the mining laws, while the solar energy application is being considered by the BLM for authorization.	Yes/No	In existing code 43 USC Sec. 1714 ??? Not found in existing IMs.	

A.2.1.2.2.7	On the basis of the analysis of the application and the necessary coordination described above, the BLM can exercise its discretion to deny an application that it finds to be inappropriate for solar ROW uses (43 CFR 2802.10(3)) or to be insufficient under any section of the ROW regulations . Projects that will cause unacceptable impacts to important resources and values will be denied. The denial of an application is an appealable decision. Offices must develop a rationale and record to support their decision to deny an application. Although they do not form a comprehensive list of items for consideration , the following items must be considered in the analysis of applications.	Yes	IM 2011-060 reaffirms BLM authority to reject appplications that cannont demonstate technical or financial feasibility. IM 2011-061 clarifies authority to reject appplication if the proposal does not avoid conflict with sensitive resources and values, and authority to screen applications for "potential for conflict" and prioritize processing based on those issues.	This restatement of the authority to reject is a helpful step forward by creating a third decision point (other than the terminal decision point under NEPA and, for some state offices, the POD evaluation required under FLPMA) for managing applications. However, fact that tied back to regulations NOT designed for this type of development is troublesome and is not responsive to the concerns raised by developers and conservationists to date

A.2.1.2.2.7.1	At the time a ROW application is submitted, the BLM will review the best available landscape-scale information (including information developed through complete or ongoing landscape conservation cooperatives [LCCs], partnerships, and rapid ecological assessments [REAs]) and will determine whether areas proposed for solar ROW uses and/or associated transmission facilities are inconsistent with other high-priority conservation, restoration, and/or adaptation objectives.	No		• Spirit here is sound and should be applauded • There is no description of where in process this analysis would be undertaken
A.2.1.2.2.7.2	The extent to which the proposal will result in impacts to open space, particularly large and/or regionally important, undisturbed tracts. In general, proposals that utilize previously disturbed areas or areas that otherwise lack important open-space values will be given strong consideration	No		"Strong consideration" is not meaningful or proscriptive - should be favored with description of how or in what process.
A.2.1.2.2.7.3	The extent to which the proposal will result in impacts on areas of critical environmental concern (ACECs) and other special areas or sensitive cultural, recreational, wildlife, or visual resources, including special areas and resources administered by other agencies or organizations. In general, proposals that avoid impacts on resources that are the basis for special designations (e.g., National Parks and Monuments) will be given strong consideration.	No	Although ACECs are "medium potential for conflict" in IM 2011-061.	
A.2.1.2.2.7.4	The extent to which the proposal will result in impacts to high priority landscape features or focal areas important for conservation, restoration, and/or adaptation to climate change, including core areas, corridors, and buffers for vulnerable species.	No		Assume mean "adverse impact."

A.2.1.2.2.7.5	The extent to which the proposal will result in impacts on mitigation lands identified in previously approved projects, including those lands onto which plants or wildlife are translocated and any lands that are restored or managed more intensively to mitigate project impacts.	No	Although IM 2011-61 requires pre-application discussions, one of the purposes of which is to identify other existing authorized uses near the project area. Are mitigation lands considered authorized uses?	
A.2.1.2.2.7.6	The extent to which the proposal will result in impacts to lands donated or acquired for conservation purposes. Applicants will be advised to avoid these lands or provide details on how they would plan to operate or mitigate their project in a manner consistent with the values of the lands donated or acquired for conservation purposes.	No		Needs to be linked to terms of the donation.
A.2.1.2.2.8	The BLM may consider proposed solar energy projects in areas with potential wilderness characteristics or in areas of citizen-proposed wilderness. Where these lands have not previously been inventoried, or where the BLM determines that the inventory should be updated, then, as part of the environmental review for proposed solar energy projects, these lands will be inventoried for wilderness characteristics. If an inventory determines that the lands have wilderness characteristics, then, consistent with applicable policy, the BLM shall consider whether to initiate a land use plan amendment process to determine how these lands should be managed. After completing the inventory process, if the BLM determines that wilderness characteristics are not present, it may proceed to process the proposed solar energy project consistent with applicable policy.	No	Although IM 2011-061 lists "lands with Wilderness characteristics outside Wilderness and Wilderness Study Areas that have been identified in an updated inventory" as "medium potential for conflict."	Revised policy approach sense – why not also do for habitat? If lands are found to be of wilderness quality pursuant to prevailing SO, the lands should be immediately segregated from consideration for further development pending Congressional action

A.2.1.2.2.9	The BLM will review the lands for sensitive resources and resource uses (e.g., paleontological, Endangered Species Act [ESA] listed, and BLM sensitive status species) and for potentially affected resources and values under the administration of other agencies (NPS, etc.). Assessment of the resources will include coordinating with appropriate federal, state, and local agencies that have regulatory authority for such resources. Coordination with the NPS may include a determination by the NPS as to whether a proposed project has the potential to cause unacceptable impacts to the resources and values of NPS-administered areas. (See recommendation to establish a local coordination protocol in Administration Policies above.)	No	Coordination with agencies recommended, not required, in IM 2011-003.
A.2.1.2.2.10	The BLM will consider the visual resource values of the public lands that could be affected by proposed solar energy development projects, consistent with BLM visual resource management (VRM) policies and guidance. The BLM will also coordinate with other potentially affected land managing agencies (including the NPS) regarding potential impacts to visual resources within shared viewsheds.	Yes, to some extent	IM 2011-061 places Visual Resource Management classes in different levels of "potential conflict."
A.2.1.2.2.11	To enhance the consideration and protection of the resources and values associated with shared landscapes (including nearby county, state, Tribal, or other federal agency lands, such as NPS lands), the BLM will coordinate and/or consult, as appropriate, with stakeholders who may be adversely affected by the BLM's decision to issue a ROW authorization for a solar energy development project. Potentially affected federal and state land managers will be provided the opportunity to participate in pre-application meetings with prospective project applicants (see Pre-application Meeting section above).	Yes	IM 2011-059, and IM 2011-061 requires pre-application meetings.
A.2.1.2.2.12	The BLM will review applications to determine if the applicant can demonstrate adequate financial and technical capability to construct, operate, and maintain the solar energy facilities.	Yes	Preceded by IM 2011-003 as modified by IM 2011-060.

A.2.1.2.2.13	The BLM will review applications to determine completeness. If necessary, the applicant will provide, in a timely manner, additional information requested by the BLM to process an application.	Yes	Due diligence requirements in IM 2011-060.	
A.2.1.2.2.14	Applicants will be required to submit an initial processing fee deposit and enter into a formal cost recovery agreement with the BLM for each solar energy ROW application filed. The applicant will provide, in a timely manner, the required processing fees.	Yes	Processing fees in 43 CFR 2804.14. Cost recovery requirements in IM 2007-097 and IM 2011-061.	Strongly agree but significant additional information is needed to ascertain whether materially different from a general restatement of existing direction. RECOMMENDATIONS: • Increase amount to $75,000 to dampen speculation, non-refundable • Charge holding fee • Offer different cost recovery options outside of zones?
A.2.1.2.3.1	Applicants for solar energy development on BLM-administered lands shall develop a BLM-approved plan of development (POD) that incorporates the required programmatic design features and SEZ-specific design features established in the BLM's Solar Energy Program and, as appropriate, the requirements of other existing and relevant BLM mitigation guidance, approved land use plans, and current policies. The POD must address all components of a solar energy generation facility, including the installation and maintenance of solar collectors, water for steam generation and cooling purposes, oil or gas used by backup generators, thermal or electrical storage, turbines or engines, access roads, and electrical inverters and transmission facilities.	No	IM 2011-060 states that PODs must have enough basic information to begin environmental review but does not go into detail on these further components.	
A.2.1.2.3.2	Management goals and objectives for special status species (such as the sage grouse and desert tortoise) that the BLM has identified in land use plans or goals and objectives substantiated by best available information or science shall be incorporated into the POD for proposed solar energy projects.	No	BLM special status species policy is in BLM Manual 6840, but no requirements to include in POD ???	

A.2.1.2.3.3	Individual projects will incorporate adaptive management strategies to ensure that potential adverse impacts of solar energy development are avoided, minimized, or mitigated to acceptable levels. Operators will be required to develop monitoring programs in coordination with the BLM, to establish metrics against which monitoring observations can be measured, to identify additional potential mitigation measures, and to establish protocols for incorporating monitoring observations and additional mitigation measures into standard operating procedures and project-specific stipulations.	No		BLM should develop standard monitoring protocols for biomes and require their use. Should be funded by surcharge on all pending and new applications
A.2.1.2.3.4	The BLM must complete an environmental review of solar energy ROW applications in accordance with NEPA prior to issuing a ROW authorization. The coordination and considerations discussed above will also be an integral part of the necessary NEPA analysis. The level of environmental analysis to be required under NEPA will be determined at the field office level on an individual project basis . To the extent that land use plans and/or this PEIS anticipate issues and concerns associated with individual projects, including potential cumulative impacts, the BLM will tier from land use plans and/or the PEIS analysis, thereby limiting the required scope and effort of additional project-specific NEPA analysis. For projects that are proposed in SEZs, only limited additional NEPA analysis may be necessary because of the depth of the analysis contained in the PEIS. Potentially affected federal, state, local, and Tribal land managers and government agencies should be invited to participate as cooperating agencies in BLM's site-specific NEPA processes for solar ROW applications.	No	NEPA for solar clarified in IM 2011-059, but not with regard to zones.	

A.2.1.2.3.5	The BLM will conduct project-specific public involvement prior to issuing a ROW authorization for solar energy development to ensure that all concerns and issues are identified and adequately addressed. Public involvement may occur as part of the NEPA process or separately, depending on the type of NEPA analysis undertaken. Opportunities for public involvement include, but are not limited to, scoping, public meetings, and public review and comment on completed NEPA documentation.	Yes	NEPA for solar clarified in IM 2011-059.	
A.2.1.2.3.6	The BLM will initiate government-to-government consultation with Indian Tribal governments whose interests might be directly and substantially affected by activities on BLM-administered lands and as required under Section 106 of the National Historic Preservation Act of 1966 (NHPA) as early in the project development process as appropriate to ensure that construction, operation, and decommissioning issues and concerns are identified and adequately addressed.	Yes/No	In statute. ??? Tribes may be included in pre-application discussions in IM 2011-061, but not required.	
A.2.1.2.3.7	The BLM will consult with the appropriate State Historic Preservation Officer(s) (SHPOs) and the Advisory Council of Historic Preservation, as required by Section 106 of NHPA	Yes	In statute.	
A.2.1.2.3.8	When lands are identified for project mitigation, the BLM will consider amending the applicable land use plan to identify those lands as ROW exclusion areas. Examples of project mitigation lands may include, but are not limited to, lands onto which plants or wildlife are translocated and any lands that are restored or managed more intensively to mitigate project impacts	No		Should amend, not "consider amending"
A.2.1.2.3.9	The BLM will determine if the proposed action may affect any listed or proposed threatened or endangered species or critical habitat. If so, the authorized officer would comply with Section 7 of the ESA	Yes	In statute.	
A.2.1.2.3.10	On the basis of the required NEPA analysis and public process, the BLM may decide to deny an application for a solar ROW authorization.	Yes	This authority is reaffirmed in IM 2011-060 and IM 2011-061.	

A.2.1.2.4.1	Utility-scale solar energy projects will be authorized as ROW authorizations under Title V of the Federal Land Policy and Management Act and 43 CFR Part 2800.	Yes	Reaffirmed many times, most recently in IM 2011-061.	ROW are a poor fit as a legal instrument - should lease. At a minimum, create a new right-of-way grant application form for solar (different from SF299) or create a supplement to the SF299 specific to solar energy
A.2.1.2.4.2	The BLM will issue all solar energy ROW authorizations for a term not to exceed 30 years; shorter terms may be justified in some cases. Each solar energy ROW authorization will contain a specific provision allowing for renewal, consistent with the regulations.	Yes	IM 2011-003.	concerns with renewal terms in regs
A.2.1.2.4.3	All solar energy ROW authorizations will be issued subject to valid existing rights.	Yes	Statute.	
A.2.1.2.4.4	The BLM will require payment of annual rent for use of the public lands on the basis of a rental schedule. The rental schedule will include a base rent for the acreage of public land included within the solar energy ROW authorization and an additional megawatt capacity fee based on the total authorized megawatt capacity for the approved solar energy project on public lands administered by the BLM. The BLM may adjust the rental whenever necessary, to reflect changes in fair market value as determined by the application of sound business management principles, and so far as practicable and feasible, in accordance with comparable commercial practices. The rental provisions of the authorization may also be modified consistent with the provisions of any regulatory changes or pursuant to the provisions of new or revised statutory authorities.	Yes	IM 2010-141.	Raise concerns about the inherent limitation of a rent-based system to precisely accomplish the goals of FLPMA; Value of phase-in and relief; Reserve right to amend at any time = less certainty; Efficiency argument on rents (but what is solution?); Revenue reinvestment

A.2.1.2.4.5	The BLM will require a Performance and Reclamation Bond, in an amount determined by the authorized officer, for all solar energy development projects on BLM-administered lands to ensure compliance with the terms and conditions of the ROW authorization and to address environmental liabilities associated with hazardous waste and hazardous substances; decommissioning, removal, and proper disposal of improvements and facilities; and reclamation, revegetation, restoration, and soil stabilization. The authorized officer will require that the holder submit a Reclamation Cost Estimate for review and to assist the authorized officer in determining the bond amount. The authorized officer will review the bond on an annual basis to ensure the adequacy of the bond amount. The authorized officer may increase or decrease the bond amount at any time during the term of the ROW authorization, consistent with the regulations.	Yes	IM 2011-003.	RCE sound; Concerns about effectiveness of reclamation
A.2.1.2.4.6	All solar energy ROW authorizations will include a provision that specifies that ground-disturbing activities cannot begin until the BLM authorized officer issues a Notice to Proceed (Form 2800-15). Each Notice to Proceed will authorize construction or use and occupancy only as therein expressly stated and only for the particular location or use and occupancy therein described (i.e., a construction phase or site location). The holder will not initiate any construction or other surface disturbing-activities on the ROW without such prior written authorization of the BLM authorized officer.	Yes	IM 2011-003.	

A.2.1.2.4.7	Upon issuance of a ROW authorization that precludes livestock grazing, the BLM authorized officer will issue a separate proposed grazing decision to the grazing permittee/lessee that includes a copy of the ROW authorization. The proposed grazing decision will (a) state that the effective date of the permit/lease cancellation, and issuance of a new permit/lease for any remaining permitted use, will be 2 years from the permittee's/lessee's receipt of the certified letter; (b) address compensation for range improvements; (c) inform the permittee/lessee of his/her ability to unconditionally waive the 2-year notification requirement; and (d) address grazing management changes as required by the ROW issuance decision. The proposed grazing decision will become final unless protested.	No	
A.2.1.2.4.8	Upon issuance of a ROW authorization that includes meteorological or power towers or other tall structures that could pose a hazard to air navigation, the BLM will ensure the locations of such facilities are noted on aerial navigation hazard maps for low-level flight operations that may be undertaken by the BLM and other federal or state agencies for fire operations, wild horse and burro censuses and gathers, wildlife inventories, facility maintenance, or other activities.	No	But is included in IM 2009-043 for wind.
A.2.1.2.4.9	Failure of the holder to comply with any diligent development provision of the authorization may cause the authorized officer to suspend or terminate the authorization in accordance with 43 CFR 2807.17–2807.19 and use the posted Performance and Reclamation Bond to cover the costs for removal of any idle or abandoned equipment and/or facilities.	Yes	In 43 CFR 2807.17–2807.19 and reaffirmed in IM 2011-003.

A.2.1.2.4.10	The holder shall perform all operations in a good and workmanlike manner, consistent with the approved POD, so as to ensure protection of the environment and the health and safety of the public. The authorized officer may order an immediate temporary suspension of operations, orally or in writing, in accordance with 43 CFR 2807.16 to protect public health or safety or the environment.	Yes	In terms and conditions as required by 43 CFR 2805.12.	
A.2.1.2.4.11	Upon the request of the BLM authorized officer, the holder shall provide access to environmental, technical, and financial records, reports, and information related to construction, operation, maintenance, and decommissioning of the ROW authorization.	Yes	IM 2011-003.	
A.2.1.2.4.12	The BLM authorized officer may change the terms and conditions of the authorization as a result of changes in legislation, regulations, or as otherwise necessary to protect public health or safety or the environment in accordance with 43 CFR 2801.15(e).	Yes	Statute.	
A.2.1.2.4.13	Operators of solar power facilities on BLM-administered lands shall coordinate with the BLM and other appropriate federal, state, and local agencies regarding any planned upgrades or changes to the solar facility design or operation. Proposed changes of this nature may require additional environmental analysis and/or revision of the POD.	No	In terms and conditions for some projects.	
A.2.1.2.4.14	The solar ROW authorization, shall, at a minimum, be reviewed by the BLM authorized officer at the end of the 10th year and at regular intervals thereafter not to exceed 10 years.	No	In terms and conditions for some projects.	How will this conform with adaptive management ideas?
A.2.1.2.4.15	The solar ROW authorization may be assigned consistent with the regulations, but all assignments are subject to approval by the BLM authorized officer.	No	In terms and conditions for some projects.	Real concern fuel speculation and waste scarce resources; already proven insufficient

A.2.1.2.4.16	An application for renewal must be submitted at least 120 days prior to the expiration of the existing authorization. The BLM authorized officer will review the application for renewal to ensure the holder is complying with the terms, conditions, and stipulations of the existing authorization instrument and applicable laws and regulations. If renewed, the ROW authorization shall be subject to the regulations existing at the time of renewal and any other terms and conditions that the authorized officer deems necessary to protect the public interest.	No	In terms and conditions for some projects.	Should be viewed as relicensing not just renewing land use – comprehensive chance to review whether current technology is optimal use of space, configuration could be modified given new conditions, etc.; need to move up deadline to 360 days given reclamation obligations

APPENDIX IV. EVALUATION OF EXISTING METHODOLOGIES FOR DETERMINING NEED

Determining whether additional acreage should be made available for solar development is key to ensuring both that taxpayers receive a fair return for the use of public lands as an input into commercial electricity production, and that project proponents and agencies can focus on only the most promising areas for solar development to ensure faster and cheaper project reviews. States have traditionally been the primary determiner of need for new electric generating facilities in the West. An examination of the states featured in the Draft Solar Energy Programmatic Environmental Impact Statement (DPEIS) six-states shows that directed efforts are underway, and that BLM should consider how to integrate into a five-year reassessment process.

Assessing Need: Acres as Megawatts

BLM's Reasonably Foreseeable Development Scenario (RFD) presents an aggressive solar energy development scenario on the public lands. With greater attention and recognition of already-existing electricity planning processes, BLM can better tailor its Solar Energy Zones (SEZ) towards policy objectives for renewable energy generation set through states and regional entities. BLM should view the need for additional acres in solar energy zones through the lens of renewable energy goals set in megawatt-hours of demand, which accounts for the capacity factor of various solar technologies. If BLM were to act independently of existing electricity planning exercises, the agency would risk inaccurately assessing the number of acres that should be made available for solar energy development.

When considering acres for inclusion in a SEZ, BLM should rely on outside expert consultation regarding electricity demands, markets, and renewable energy policies. Utility approved plans, state public utility commissioners, and regional planning entities such as California-Independent System Operator (ISO) and the Western Energy Coordinating Council can all provide useful inputs into BLM's determination of needed additional acreage to meet new renewable generation goals. BLM should take into consideration policy goals and trends in the solar market.

How is Need Determined?

Developers licensed to sell power in a state must comply with specific laws within each state to regulate electricity. Every state in the U.S. has established a regulatory agency known as the "public service commission" (PSC) or "public utility commission" (PUC) which oversees public utilities.[62] These are an independent regulatory agencies made up of staff and a judicial body (appointed by the state legislature) which determines the "just and reasonable price" that a utility can charge for its service.

The basis for additional capacity in the electricity system is determined by an assessment of "need" for system upgrades, also termed a "load forecast." Need is evaluated under the economic

[62] Municipalities and cooperatives responsible for serving customers are not regulated by utility commissions and individual state rules apply to these electricity providers.

and reliability frameworks by the regulatory agency which oversees rates paid by consumers, also referred to as the "rate base." Utility proposals for new capital investments (new generation, transmission, or distribution infrastructure) are presented to the state regulatory agency for review to determine the necessity of a system upgrade before the utility may proceed with a building project. Frequently this request is in the form of an application for a "certificate of public convenience and necessity." This is the recognition that there is a need for new generation or transmission capacity that will ensure that the reliability needs of the system are met while costs are kept prudent.

Load forecasts are constantly evaluated through a number of planning processes including utility, municipality, or cooperative plans, and through planning processes established within regional markets. "Needs" assessments are based on two principles: ensuring the reliability of the bulk electric power sector and keeping the cost of electricity low by providing access to the lowest cost electricity available in the market. These objectives are constantly evolving as local, state and federal policies and regional electricity markets shift towards renewable goals. At the federal level, the North American Electric Reliability Corporation is responsible for setting the reliability standards and monitoring the bulk electric power system.[63] At the state level, the impact to the customer rate base of a regulated utility is considered by the state's public service commission.

State-Specific Practices

All of the states included in BLM's solar PEIS engage in advance load forecasting for electricity demand.

Arizona
The Arizona Corporation Commission requires electric utilities in the state to engage in Integrated Resource Planning. Every two years, utilities file a 15-year plan to identify how they will meet future demand as well as the type of generation that will be used to meet future load.

California
Three agencies in California govern generation and transmission, the California Public Utility Commission (CPUC), the California Energy Commission (CEC) and the California-ISO. The CEC is responsible for load forecasting, the CPUC assigns particular utilities the amount of megawatts they need to build, and utilities work through the CA-ISO to design a plan for meeting load forecasts.

California has a specific loading order to meet demand:

1. Energy efficiency
2. Demand-side management
3. Renewables, to meet a Renewable Portfolio Standard
4. Conventional sources, most of which are natural gas, but no coal

[63] NERC was designated by the Federal Energy Regulatory Commission as the national electric reliability organization (ERO). For additional information on NERC, visit www.nerc.gov.

Colorado
To determine need, Colorado engages in "electric resource planning" (ERP), similar to "integrated resource planning." The ERP is undertaken every four years and looks out 10 years for projected demand. The ERP is required for regulated utilities, which are responsible for supplying approximately 60 percent of Colorado's electricity needs. All types of resources can be included in the utilities "acquisition plan." Colorado's Renewable Electricity Standard (RES) states that 30 percent of retail electric sales to customers of regulated utilities by 2020 will come from renewable resources. The remainder of Colorado is served by cooperatives which are not regulated by the PUC. Cooperatives have a lower RES goal of 10 percent by 2020.

Nevada
Load forecasting in Nevada is determined through an IRP process. Ninety to ninety-five percent of the state's electricity is met by investor owned utilities (IOU). Under the IRP, IOUs are required every three years to file a 20-year forecast. This forecast includes current resources, projected load, and planned retirements. IOUs then file a new generation plan to meet future load which is subject to review by the Nevada PUC.. IOUs are tasked with determining an optimal level of cost-effective DSM to meet future load. The Nevada PUC approves rates for the subsequent three years of the plan and oversees placeholder agreements for generation and transmission for the 20-year plan. Once approved, IOUs can file amendments to the IRP to accommodate shifts in demand and technological advances.

The RPS requirement is a component of the IRP. IOUs are not required to have in place contracts for RPS requirements more than three years out. On April 1st each year, Nevada compiles a progress report on how utilities are meeting their RPS requirements.

New Mexico
The Renewable Energy Act ("REA"), §§ 62-16-1 et seq. NMSA 1978 and Title 17.9.572 NMAC[64] ("Rule 572") establish an RPS applicable to all IOUs in New Mexico. IOUs must have in their portfolio as a percentage of total retail sales to New Mexico customers, renewable energy of no less than 15 percent by 2015 and 20 percent by 2020.

In addition to the RPS, Rule 572 requires that IOUs must offer a voluntary renewable energy program to their customers. In addition to and within the total portfolio percentage requirements, utilities must design their public utility procurement plans to achieve a fully diversified renewable energy portfolio no later than January 1, 2011, as follows:

- *No less than 20 percent wind*
- *No less than 20 percent solar*
- *No less than 10 percent other technologies*
- *No less than 1.5 percent distributed generation (2011-2014) and 3 percent distributed generation by 2015*

[64] http://www.nmcpr.state.nm.us/NMAC/parts/title17/17.009.0572.htm

Utah

The Utah Public Service Commission has jurisdiction over the only public utility in the state. Pacific Corps serves 80 percent of the load in Utah, and the remainder is served by municipalities and cooperatives. Pacific Corps engages in an IRP process for their service territory in six-states every two years in order to provide a framework for resource acquisition. The IRP process is acknowledged by the Utah PSC and serves as the basis for determining load forecasting to meet the state's RPS. Pacific Corps files a progress report for meeting the RPS with the Utah PSC.

APPENDIX V. RECOMMENDATIONS FOR PERFORMING DROP-DOWN ENVIRONMENTAL ANALYSIS WITHIN DESIGNATED ZONES

This appendix details the methods used to approximate impacts for Solar Energy Zones (SEZs) in the Draft Solar Energy Programmatic Environmental Impact Statement (DPEIS), and suggests additional analyses that would be necessary to provide a basis for development. Although the analyses performed in the PEIS are not currently sufficient to permit tiering at the project level, the monitoring program defined below would build the baseline data needed and would provide a foundation for a defensible zone-based solar program that streamlines environmental review at the project level. Suggested monitoring efforts and protocols mirror those being pursued by other agencies as well as those the Bureau of Land Management (BLM) is in the process of implementing in other contexts.

Special Status Species Analysis Performed in the PEIS

The methods used for the Special Status Species (SSS) analysis in the PEIS are summarized below.

- Define the area of direct effects (the zone itself as well as projected road and transmission access corridors to access the nearest transmission and state/U.S. highways).
- Define the area of indirect effects by buffering each solar energy zone by five miles. These are areas with no ground disturbance that could be affected by dust, runoff, noise, lighting, pollution, etc.
- Define a "SEZ region" around each SEZ that includes all lands within a 50-mile buffer of the SEZ centroid.
- Use heritage, state fish and game, and Southwest Regional Gap Analysis Project (SWReGAP) data to define species lists of all SSS that might be present in the SEZ region, direct, and indirect effects areas. These species include:
    - Threatened or endangered under the Endangered Species Act (ESA)
    - Proposed for listing, review, or candidate species under ESA
    - BLM sensitive species
    - State listed species
    - Species that have been ranked as critically imperiled (S1) or imperiled (S2)
    - State or U.S. Fish and Wildlife Service (FWS) species of concern
- Use SWReGAP habitat models to project the proportion of habitat for each species in the direct effects area relative to the SEZ region.
- Assign a projected impact of low (<1 percent), medium (1-10 percent), or high (>10 percent) based on the proportion of habitat in the direct effects area compared to the SEZ region.

The critical stage of this analysis is defining suitable habitat for SSS. The model output used for this purpose, SWReGAP, is based on associating species with vegetation cover types, then further restricting distribution using elevation and knowledge of the geographic range of the species in question. It is well documented that these models over-predict suitable habitat for most species, and for some quite dramatically. For example, SWReGAP models associate Great

Basin amphibian species with blackbrush when they are actually associated with water bodies found within blackbrush-dominated systems. Accuracy assessments of these models for a range of species found in Utah's national parks (Edwards et al. 1996) compared park verified species lists with those predicted from SWReGAP models and found the models consistently over-predicted for well studied taxa (birds and mammals) and that accuracy decreased with study area. The authors state that extrapolating results at scales smaller than that of Utah's national parks "is problematic and should be viewed with caution." Although there are two SEZs in California that approximate this size (Iron Mountain and Riverside East), all other SEZs are approximately one order of magnitude less than this, making it fairly certain that presence of SSS in the direct and indirect impacts areas of most SEZs has been overestimated. The inaccurate results that come out of this analysis extend beyond over-defining species that might be present; by over-predicting distribution of species, the output of the analysis also potentially under-represents the vulnerability of a species. In other words, if a species is present in a SEZ or in the area of indirect effects, its habitat is likely more limited than predicted, and the habitat that is actually being used in this area could be far more important than indicated by the analysis.

For the reasons detailed above, the scope and detail of this analysis is insufficient to allow the PEIS to be tiered off through the use of project-level Environmental Assessments. In addition to over-predicting, the analysis presented in the DPEIS allows no inference to the status and trend of SSS or to the amount of habitat actually occupied.

We feel that the existing analysis provides enough detail at the programmatic level to inform the next level of SSS analysis, however. Specifically, it provides a conservative species list for each SEZ that can be used as the basis for the assessment and monitoring program detailed below. A comprehensive consideration of impacts will require the use of two additional layers of Environmental Impact Statements, one layer that examines cumulative impacts at the scale of individual SEZs and their surrounding landscapes, and one that builds off the SEZ-level EIS to quantify impacts and mitigation at the individual project level.

Previous BLM Monitoring Efforts

The legal obligation of BLM to initiate and maintain monitoring programs that quantify the status and trends for a range of special status species was discussed previously. Although systematic monitoring has been initiated on some BLM lands, effort has historically been patchy and inconsistent, particularly in areas where there is little public interest and few obvious, high profile resource values to protect. By the Bureau's own admission (Falise et al 2005), monitoring programs until very recently frequently lacked clear objectives, gathered incomplete information, failed to analyze collected data, did not tie monitoring to management actions, and lacked targets and thresholds to influence future management. For the most part, past evaluations have focused on "moment in time" assessments and on projects and leases at the local scale. In addition to spatial and temporal limitations, data were not collected using a statistically designed sampling method, allowing no inference to cumulative impacts at the landscape scale and no basis to support a monitoring program (BOA 1994, Pellant et al. 2005). However, these previous efforts do provide some baseline data, background knowledge of ecological systems and their key drivers, and information relevant to selection of monitoring sites (Habich 2001, O'Brien et al. 2003, Pellant et al. 2005).

Recently Proposed and Ongoing BLM Monitoring Relevant to the Solar PEIS

Recently there have been several exciting developments in BLM monitoring protocols that, if executed properly, would effectively define ecological baseline data and determine status for many sensitive species. The BLM's flagship monitoring program for the new National Monitoring Strategy is detailed in Kotliar et al. 2008, where it is applied to create a regional approach to wildlife monitoring in oil and gas development areas in Colorado. This framework is quite flexible, and could be adapted to the range of species found in the various SEZs, as well as to abiotic resources such as groundwater, surface water, and soils. The basic approach detailed in Kotliar et al. 2008 is suggested as a framework to organize and focus field surveys and modeling that will feed into a cohesive monitoring system for SEZs and the projects sited within them. The authors describe a seven-step framework that is executed iteratively in a three-phase process that could be applied at the level of the SEZ region and scaled up to landscapes or ecoregions. Phase I, which synthesizes existing data and model outputs to evaluate the cumulative effects of solar development, would take place at the scale of individual SEZ regions. Phase II takes place at the same scale, and uses the data collected in Phase I to clarify management objectives and link them to management decisions. Phase III scales the previous analyses up to the field office scale and beyond, linking them with similar studies in adjacent SEZs and providing a broad context for project level analyses. Thorough implementation of this three-phase process would be sufficient for the SEZ-level EIS. Provided that analyses at the SEZ level create a sound baseline of data to assess status and trend across landscapes for focal species, project specific efforts could tier extensively off this research and be completed with a reduced level of effort.

An implicit part of the framework is identification of the highest priority species and management issues for the study area, as well as the ability to update all information sources listed above as new information, tools, and insights become available in later phases. Proper use of this process would allow inference to the status and trends of SSS as well as the stressors that affect them, linking stressors to indicators and to management and mitigation. In short, it would allow BLM to meet its legal obligation for stewardship of lands and sensitive species related to solar energy development.

Application of BLM's New National Monitoring Strategy to Further SEZ Review

As required by BLM, the monitoring protocol described in Kotliar et al. used a seven-step framework adapted from Mulder et al. (1999). This framework could be applied to the DPEIS if the agency takes the following steps:

1. **Develop, Refine, and Prioritize Initial Monitoring Goals and Objectives**
   Extensive meetings with personnel from BLM and other agencies as well as stakeholders is essential at this stage to define objectives and the scale(s) at which they should be analyzed. A preliminary list generic to all SEZs is given below.
   - Prior to SEZ development, evaluate population status of selected SSS and/or focal species. If possible, use the same analysis along with existing data to evaluate trend for those species.

- Define the natural range of variation of parameters of interest (abiotic and biotic) and explore how cumulative effects of development would affect this range of variation.
- Define areas not available for solar development, whether inside or outside SEZs, that could be used to offset impacts in areas to be developed.
- Ensure that the net effect of development (taking into account areas to be developed as well as any mitigation to offset impacts) do not result in unacceptable impacts to focal species.

2. Identify Key Stressors

Stressor identification occurs concurrently with formulation of goals and objectives, and also requires diverse agency and stakeholder input. As mentioned above, all work is subject to revision; stressors must have clear ties to ecosystem processes and states, but they must also be possible to assess with a degree of precision in order to be useful. An iterative process is needed to determine the best set for a given area. Stressors might include:

- Habitat loss within developed areas.
- Habitat loss outside of developed areas due to fragmentation, disturbance, erosion, invasive weeds, dust loading, and other indirect and cumulative effects on surface habitat features.
- Drop in groundwater levels directly impacting species (e.g. vegetation dependent on phreatic water).
- Drop in groundwater levels indirectly affecting surface water dependent species through surface water hydrology.
- Blockage of migration/movement corridors needed for population viability.
- Loss of soil fertility due to ground disturbance and associated loss of topsoil and biological soil crusts.
- Direct mortality to species from equipment.
- Indirect mortality due to loss of forage or prey.
- Invasive exotic species displacing native species and disrupting plant communities.

3. **Create Conceptual Models For Ecosystem Function and Stressors, Develop Regional Questions**

The general conceptual model used in Kotliar et al. generally applies to the southwest desert and Great Basin cold desert ecosystems being considered for development in the DPEIS.

In the figure below, the dominant ecological processes are shown in text outside the boxes, processes and pathways that drive ecosystem changes are represented by arrows, and major biotic and abiotic components of the ecosystem are within the polygons. Stressors disrupt the

processes, but are not shown explicitly.

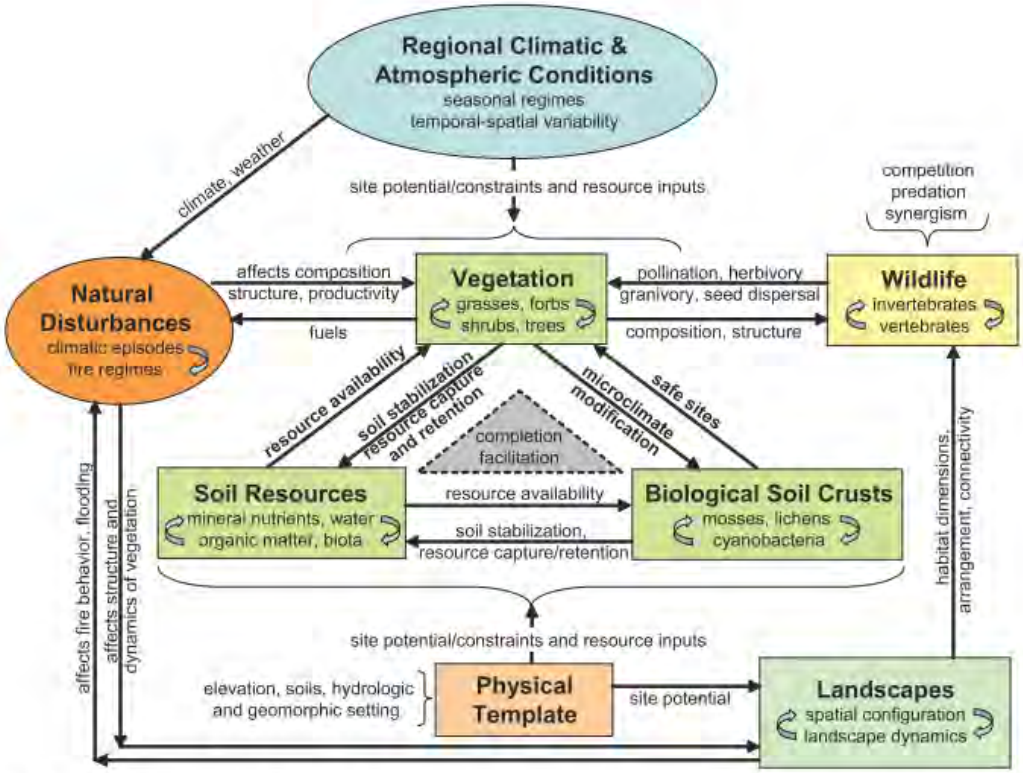

Figure 9. Conceptual model illustrating key structural components (rectangles) and functional relationships (arrows) of ecosystems for the Colorado focal area. Ovals represent natural drivers of temporal variability and change (adapted from Miller, 2005).

Regional questions would be expected to vary across the range of desert ecosystems encompassed in the solar PEIS. Several examples of these questions are:

- In the Chihuahuan desert, how can solar development proceed without exacerbating pre-existing trends of conversion of native grasslands to habitats dominated by invasive shrubs such as creosote?
- In the Great Basin deserts of Nevada and Utah, how can water use for solar development and other existing uses avoid regional groundwater depletion effects that cascade through connected basins?
- In multiple desert ecosystems, how can ground clearing associated with development avoid impacts associated with loss of topsoil and soil crusts, spread of invasive weeds, associated changes in nutrient and fire regimes, dust loading and air quality issues, accelerated snowmelt and changes in groundwater availability, etc.?
- In multiple desert ecosystems, how can solar development be made compatible with the need to preserve long-lived keystone plant species such as Saguaro cactus, Joshua tree, and tall sagebrush species that are already compromised by development activities, and for which restoration efforts have been largely unsuccessful?

4. Select and Prioritize Indicators, Assess Information Availability and Needs

The conceptual models provide the initial basis for selection and prioritization of indicators, which would again be chosen using inputs gathered through a stakeholder process. Indicators suggested below are a small, generic subset of those that could be selected. References associated with the use of each indicator are provided; some references support the use of the indicator while others detail how it can be quantified. Most of the indicators suggested below are ones that lend themselves to the use of remotely sensed data; practical implementation of the suggested monitoring should minimize field data collection requirements while still capturing important ecosystem properties and maximizing predictive power. However, remote sensing would not be sufficient by itself to quantify baseline data. SEZ and region-specific field data, both existing and new, would also be required to both supplement and calibrate remotely sensed data (Wallace and Marsh 2005, Wallace et al. 2008). Indicators derived from new field data would be defined in Phases II and III of the process, and are not listed here.

- Percent bare ground, mean bare patch size, and other metrics of ground cover (Whiteford et al. 1998, de Soyza et al. 2000, Pyke et al. 2002, O'Brien et al. 2003, Herrick and Pyke 2008).
- Percent cover by life form, species, or species type (de Soyza et al. 2000, Knick et al. 1997, Whiteford et al. 1998).
- Percent cover by sagebrush (Sivanpillai et al. 2009).
- Non-native and/or invasive species (Everitt and Yang 2007, Herrick and Pyke 2008).
- Plant species of management concern (Herrick and Pyke 2008).
- Plant species richness (Herrick et al. 2009).
- Plant density (Herrick et al. 2009).
- Soil stability (Herrick and Pyke 2008, Herrick et al. 2009).
- Disturbance of soil crusts (Brotherson and Rushforth 1983, Belknap 1995, Belknap and Gillette 1998, Evans and Johansen 1999, Stohlgren et al. 2001, Ustin et al. 2009).
- Density of harvester ant mounds as indicators of shrub and invasive annual grass invasion (Bestelmeyer 2005, Fletcher et al. 2007, Ostoja et al. 2009).
- Percent cover of exotic annual grasses (Miller 2005).
- Road density, infrastructure density, and other measures of anthropogenic disturbance (Trombulak and Frissell 2000,Gelbard and Belknap 2003, Wilburt et al. 2008, Frair et al. 2008).
- Suitable habitat and activity areas for focal species (Lambeck 1997, Maes and Bonte 2006, Penrod et al. 2010).

5. Select Final Indicators and Design Sampling and Research Program

This stage requires a full evaluation of legacy data to incorporate any existing information that can be used to meet monitoring objectives. Status of populations and habitats for priority species must be evaluated, historical range of variation for important landscape processes quantified, data gaps identified, field methodologies for needed information defined, and a data management framework implemented. Based on this work, indicator selection would be further refined, defining a set of indicators that are not only encompass meaningful attributes of the ecosystem being studied, but also respond to ecosystem change in a predictable and useful manner, are

feasible to collect, make predictions at useful spatial and temporal scales, and have sufficient existing data associated with them to define the historical range of variation.

6. Identify Thresholds of Change and Triggers for Management Action
In Phase I, status and trends for priority habitats and their relationship to indicators are examined, and management targets and triggers are incomplete and mostly based on expert opinion solicited from scientists and managers. As existing data are further synthesized with newly-collected field data and knowledge of the current status and trend of monitored resources, their historical range of variation, and the behavior of selected indicators to monitor their status improves, thresholds and triggers can be further refined.

7. Integrate Monitoring into Planning, Evaluation, and Management
As above, incorporating monitoring into mitigation, restoration priorities, and proposed management action is tentative and based on incomplete information in Phase I, but is expanded in Phase II to adaptively reflect new information.

The design presented in Kotliar et al. has been further refined to make it specific to the White River Field Office in an appendix of BLM Colorado's White River Field Office Resource Management Plan Amendment. We understand that this appendix describes a Resource Management and Monitoring Protocol that builds off the work in Kotliar et al. to monitor soil, vegetation, disturbance, atmospheric, landscape spatial pattern, and water resources in addition to focal species. The focus of this effort is on monitoring surface disturbance and reclamation activities related to oil and gas development, but the general extension of the monitoring framework is exactly what would be needed to define a rigorous monitoring program for BLM lands to be developed for utility-scale solar.

This adaptation of Kotliar et al. bases indicator selection on the coarse filter approach (Noss 1987, Hunter et al. 1988), in which representative communities are protected that sustain the needs of most associated species. To cover the needs of species not adequately conserved by the coarse filter, the fine filter component tailors management to optimize habitat for these exceptions, which are ideally umbrella species (Roberge and Angelstam 2004) whose diverse habitat requirements are shared by a variety of species. In general, indictors were prioritized that were relevant to landscape changes of interest, demonstrated to be effective in the literature, feasible and reliable to quantify as a long-term metric, interpretable to decision makers and the public, and relevant to existing baseline data. The three main types of indicators proposed are attributes of key ecosystem services, direct measures of species abundance; and general descriptive or spatial statistics used to describe abundances.

Given the large anticipated data gaps, the monitoring framework suggested for solar development on BLM lands will need to emphasize efficient field data collection protocols and the use of advanced modeling techniques. The most detailed modeling process proposed for solar development to date is currently being developed for the California Energy Commission by researchers from the University of California Santa Barbara, the U.S. Geological Survey, and Conservation International.[65] This research uses an array of state of the art models capable of

[65] David, Frank et al. "Cumulative Biological Impacts Framework for Solar Energy Projects in the California Desert." http://www.energy.ca.gov/research/notices/2011-01-

accepting relatively sparse wildlife survey data and other inputs to extrapolate wildlife habitat use, approximate population status, model habitat connectivity and fragmentation. Results from these analyses can be used to guide siting, project cumulative effects, and define potential offsite mitigation areas. Monitoring abiotic indicators will also need to make use of similar modeling approaches to make the best use of existing data and monitoring resources.

The data development and analysis processes recommended above have good support in the literature, are in line with comprehensive monitoring efforts that have been underway for years at other federal agencies and non-governmental organizations, (Noss 1987, Hunter et al. 1988, Debinski and Brussard 1992, Bascietto and Higley 1992, Preston and Ribic 1992, Walker and Jones 1992, Gentile et al. 1994, NRC 1994, Paulsen and Linthurst 1994, Herlihy et al. 1997, NPS 2002, Turgeon et al. 1992, Fisher et al. 2003, Ringold et al. 2003, Lazorchak et al. 2003, O'Brien et al 2003, Parrish et al. 2003, USDA 2004, USDA 2009, Miller 2005, Herrick et al. 2009), and reflect the direction BLM has recently committed to with its National Monitoring Strategy. This overarching and long overdue initiative will ultimately extend to all energy development on BLM lands. The recommendations above are not unique to solar, nor are they to be funded by the solar energy industry: the monitoring at the SEZ and SEZ-region scale recommended above are part of BLM's ongoing stewardship obligations under the Federal Land Policy and Management Act , and are a prerequisite to further project level studies prior to development, studies that will be facilitated by the breadth of knowledge gathered at the SEZ level.

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APPENDIX VI. EVALUATION OF SOLAR ENERGY TECHNOLOGIES IN THE DRAFT PEIS

BLM Solar Draft PEIS –

Comments & Recommendations

February 28, 2011
Clean Energy Solutions LLC

Major Thematic Concerns & Recommendations

Generality of PEIS Standards

Recommendation: The BLM criteria for evaluating technologies should be principle-based and not become prescriptive based on current technology capabilities and characteristics.
Explanation: We believe that the most rational and adaptable PEIS standards will come from a careful consideration of the general nature of the public costs (e.g. natural resource impacts) vs. the public benefits (i.e. cleaner energy and reduced emissions).
The information currently included in the PEIS seems to be based heavily on the project proposals the BLM is currently reviewing and has recently approved. While these proposals are substantially more mature than previous plants, they still do not represent a mature technology in a mature industry, and there are a number of possible permutations and advancements that are now on the horizon that could affect the technology characteristics significantly.

Figures-of-Merit

Recommendation: In line with Section 1.1 of our comments, we recommend that the BLM base their EIS decisions on two primary criteria:

A. Resource consumption (such as land and water use) per annual Megawatt hour (MWh) produced by the plant, and

B. Compatibility with the existing grid.[66]

We recommend that these be used to judge all cross-system (not just cross-technology) comparisons. Under these criteria, for example, the requirements for land and water would be compared in acres/MWh/year and acre-ft/MWh/year. In addition, some qualitative benefits would be accrued to a plant that used storage to match its output to the peaking needs of the grid it is serving.

[66] Although difficult to define in the most general way, these criteria should include such characteristics as dispatchability, load balancing, and dependability of providing peaking capacity. We believe that use of these criteria can reduce need for additional infrastructure, including for example combustion turbines for spinning reserves and so on.

Explanation: When developing the solar program contemplated by the PEIS and evaluating individual proposed solar projects, the BLM is required to follow the multiple-use mandate required by FLPMA and complete environmental reviews required by NEPA. In order for the BLM to fairly evaluate proposed projects, the agency needs to have good information about how a project would fit within the requirements FLPMA and NEPA, including the project's likely impacts and benefits. This information is also critical for informed engagement by the public, environmental organizations, and other stakeholders involved in the NEPA process.

The BLM is well versed in analysis of potential impacts, but less experienced in assessing potential benefits. The benefits from proposed solar projects are namely: a) the amount of clean energy produced and the associated displacement of emissions of CO_2 and other criteria pollutants, and b) the "value" that the new generation source provides in integrating with, and supporting, the rest of the electric grid, thereby minimizing the investment in additional infrastructure.

The best indicator of CO_2 emissions displaced is the total MWh of "no carbon" electricity generated by the new systems. Because, as shown in Table 1, the majority of conventional generation in the Southwestern states is from coal and gas, the solar generation will be displacing electricity from some type of fossil fuel fired plant.[67] This metric -- MWh generated per year -- is notably different from the nominal output capacity (measured in MW) of the plant because solar plants do not typically run all of the time.[68] A reliance on nominal output capacity would potentially place promising solar power technologies -- particularly those with storage -- at a significant disadvantage despite their important capability to provide dispatchable power during a utility's peak demand period and the fact that their actual annual power output - could potentially be greater.

TABLE 1. PERCENT OF ANNUAL GENERATION FROM FOSSIL FUELS (2008)

State	% from Coal	% from Nat Gas
Arizona	37%	32.5%
California	1.1%	57.7%
Colorado	65.2%	25.2%
Nevada	22.3%	68.5%
New Mexico	73.0%	21.5%
Utah	81.6%	15.8%

The first and probably most important indication of how well the new generation sources will interface with the existing grid is the dispatchability of the plant – that is, the ability to deliver the power to the utility when it is needed, as opposed to simply whenever the sun is shining. This capability is becoming increasingly important as peak demand in the Southwest continues to grow, not only in maximum capacity delivered, but also in duration during the day and an increasing amount of power is being produced from non-dispatchable sources, mainly solar PV and wind.

For example, in the PEIS the land area required for a power tower plant and a PV plant are estimated to be the same in terms of acres/MW. However, these values are NOT good metrics for the benefits -- or value – of the plant to the public. In particular, when the tower's higher capacity factor is taken into account we can see that the acres/MWh/year would be expected

[67] Although AZ and CA in particular, have significant nuclear capacity, these plants provide base load power and are not designed for load-following. It is unlikely they would be turned down to accommodate solar generation.

[68] The difference can be obtained through comparison of the capacity factor of equally sized plants. This is the ratio of the energy actually produced by the plant in a year divided by the amount of energy produced if the plant were able to run at its nameplate capacity for the full year. It is not defined well in the PEIS document.

to be much better (i.e. smaller) than for the PV plant.[69] Similarly when comparing two CSP plants -- one with, and one without storage -- the plant without storage would have a decided advantage in acres/MW, even though the unit with storage would most likely have a lower value in acres/MWh.[70] In fact, measuring water consumption on a MWh/year basis would obviate the need for the huge (3x) range of water consumption rates listed for the trough plants, since much of this range is attributed to differences in capacity factor.

The second figure-of-merit suggested, the value of the electricity generated to the grid, is clearly much more difficult for the BLM to measure. However, the utilities have largely incorporated this metric into the prices that they offer to the developers. As a consequence probably the best figure of merit for this characteristic is the comfort of both the utility and the developer with the power purchase agreement (PPA) that they can negotiate.

The approach recommended here is both more general and less prescriptive than the variety of metrics listed in the draft PEIS. As a result it should be more adaptable to changes in the technology, or even to completely new technologies like the Solar Tower (also known as 'Solar Chimney') plants currently being proposed in Arizona.

Plant Design and Operating Characteristics

Recommendation: We recommend that the BLM rewrite the sections of the PEIS that describe the solar technologies to make them shorter, with more description of the general characteristics of the technology, and much simpler to understand. In particular, these sections should clearly identify the operating principles behind key subsystems of the CSP plants. These principles can then be used to form the basis for the plant descriptions offered later. Using this more general approach will allow the BLM and the public to fairly evaluate various proposed plants based on these descriptions.

Explanation: The draft PEIS does not accurately describe two important aspects of how CSP systems operate. First, a CSP system consists of three major sub-systems: the solar field, the power block, and the storage system (if storage is part of the plant). Within certain limits, the capacity of each of these subsystems can be varied independently to produce plants that

Important Plant Characteristics:

Solar Multiple and Hours of Storage

Solar Multiple is the ratio of the peak thermal output capacity of the solar field relative to the capacity of the power block. Thus, a plant with a solar multiple greater than 1.0 will actually collect more thermal energy than it can immediately use at solar noon on the summer equinox. Note that even when no storage is included in the design, engineers will typically use a solar multiple of 1.4 or larger, to maximize the utilization of the high-cost power block equipment.

Hours of Storage is the period of time that the fully charged storage system could drive the power block at its design capacity. The size of the storage relative to the power block is usually determined by the price paid for "on-peak" power and the daily duration of the on-peak period.

Note that increasing the size of the storage almost certainly implies increasing the solar multiple, since a larger field would be required to charge the larger storage. This will cause the acres/MW to increase, but could actually cause the acres/MWh/yr to decrease, since the capacity factor of the plant will go up significantly.

[69] In fact, for a tower plant the acres/MW ratio is NOT even a constant – it is a strong function of the radius of the field and the height of the tower, both of which are closely related to the size of the plant. This is intuitively seen by noting that the heliostats on the outer perimeter of the field need to be significantly farther apart to avoid shading and blocking. This is another example of using the characteristics of current designs to describe a technology that is in its commercial infancy.

[70] This mistake is actually made at least once in the PEIS document.

are optimized for specific economic considerations.[71] Because of the importance of these relationships, engineers have defined several terms – "Solar Multiple" and "Hours of Storage" -- to measure them, as described in the sidebar.

A plant that has a large storage system can potentially provide power through the utility's entire peak period, thus eliminating the need to operate – or potentially even to build -- costly and comparatively "dirty" combustion turbines to meet the peak demand. However under the existing draft PEIS language, such a plant is likely to not be evaluated fairly because it would require a fairly large solar field (and thus land area) relative to its capacity.

The second important mischaracterization in the draft PEIS is the relationship between the "operating temperature,"[72] the efficiency, and the water consumption of the plant. At several points in the draft PEIS it appears that the agency seems to argue against plants with higher operating temperatures, whereas in reality the increase in temperature will tend to allow the plant to operate more efficiently and will minimize the resource impacts per MWh delivered. In other words for every unit of thermal energy input, more electricity is produced.

A higher operating temperature can provide two positive benefits for the resource impacts of the solar system.

- First, since more of the thermal energy is converted to electricity, the amount of cooling -- and thus cooling water -- required is decreased.
- Second, since the power block is now producing more power per unit of thermal energy input, a smaller solar field will be required to drive a given output capacity, leading to a lower land requirement.

We recommend that the BLM rewrite the technology-related sections of the draft PEIS to correct these significant inaccuracies.

Climate Change Impacts

Recommendation: The current draft PEIS makes no reference to the impacts that on-going changes in the climate of the Southwestern U.S. will have on either the future need for, or the performance of, the solar systems. We recommend that the BLM include references to the results of current climate change models, and briefly describe how the predicted changes could impact these technologies. Inclusion of these effects will make the document more general and should help to increase its adaptability as these effects become more apparent. It is important for BLM to address this issue, so that both BLM and other stakeholders can fairly evaluate a broad range of projects and programs in the future.

Explanation: It no longer seems either reasonable or wise to ignore the changes in our climate that are underway. This is especially true when considering the cost/benefit characteristics of

[71] To take an extreme example, in northeastern Australia there is a nearly constant need for power 24 hours a day to supply the mining operations that are the bulk of the demand. This would require a CSP system that has a very large field and storage relative to the power block. This requirement if very different than the optimized design for a plant providing residential needs of the greater Phoenix, Arizona area.

[72] Although this term is never defined in the draft PEIS, it is used to mean specifically the turbine inlet steam temperature.

plants that have an economic life of more than 20 years. The changes that have been predicted are likely to have significant impacts on both the demand for electricity and the performance of the solar plants. For example, the reduced rainfall and longer, hotter summers predicted for the desert Southwest would likely both increase the size and the duration of the peak electric load, and reduce the availability of water to cool any of the thermal plants (solar, fossil or nuclear) built in this region. In addition they would also increase the production penalty associated with dry-cooling technologies.

On the face of it, these impending changes would seem to indicate a preference for systems that have the highest efficiency and thus lowest water consumption, combined with the flexibility to adapt to changing conditions in the future. This consideration would also seem to argue for the BLM to maintain significant flexibility and adaptability in its technology considerations. All of the technologies described here are immature relative to conventional power generation technologies, and will inevitably evolve considerably over time. Similarly, new solar or other renewable technologies are likely to emerge (see earlier reference to Solar Towers/Solar Chimneys) that challenge today's "conventional wisdom" and offer a different balance of costs and benefits. Again this appears to argue for using principle-based, as opposed to prescriptive, metrics when considering the potential impacts and benefits of solar plants.

Organization of Document

Recommendation: The technology sections of the draft PEIS appears to be designed to accommodate two functions: A primer on solar technology, and a "how to" instruction set for analyzing the potential resource impacts and benefits of varying solar technologies. Unfortunately, these two functions are interwoven in often confusing ways. We recommend that the BLM clearly separate them, make the solar technology description material more general and more analytical (as described in Section 1 above), and then show how the resource impact and benefits assessment relates to the general solar technology descriptions.

Recommendation: Reorganize and rewrite the technology sections, Chapter 3 and Appendix F. It's hard to see much distinction between the material presented in these two sections. In fact, in a number of cases it appears that these were authored by two separate writers who didn't read one another's section. We recommend consolidating them into a single, more general description of the technologies. Then perhaps use the Appendix to list the characteristics of specific current proposals as examples of the more general descriptions in Chapter 3.

Recommendation: We recommend that the BLM develop a glossary of important terms like solar multiple, hours of storage, capacity factor, and so on. If the definitions in this section are carefully designed, it would help a solar technology novice more quickly and completely understand some of the subtleties of the technology.

Technical issues

The following sections contain subjects that are not as general as the topics above. However, they do appear to us to be serious enough to warrant substantial attention.

Missing topics

- F-4, 11:[73] Provide a better description of how to handle fossil-hybrid system designs. The draft PEIS states that for those plants that will have fossil-fuel fired augmentation, "the environmental impacts… are not evaluated in this PEIS". We know that the BLM has procedures already in place for evaluating the environmental impacts of fossil-fuel burners, such as the procedures described in the draft EIS for the proposed Sonoran Solar project in Arizona. We recommend that these be incorporated by reference.

This important design option should be treated a bit more thoroughly to avoid confusion and potentially negative outcomes. For example, "topping off" the steam with fossil-fuels can increase the efficiency of the plant reducing both the water consumption and the size of the solar field, while also increasing the flexibility and dispatchability of the plant. It will be important that these benefits be balanced against the increased emissions profile of such a design.

Technical Problems

The following comments refer to specific pages in the document, noted by (Section-Subsection, page #). It will likely be helpful for the reader to have the PEIS at hand to understand some of these comments.

- 3-4, 19: One should be cautious about using current technology as the standard for technology comparisons. For example, in this section it is stated that water is "needed" for cooling. This is obviously incorrect since it is clear that the primary barrier to dry cooling currently is an economic one. In this case it would be correct to state that water is "typically used" for cooling thermal plants.

- 3-4, 27: In this section the water consumption of a solar plant is compared to that of a single individual. This per capita comparison is between items that are neither of the same "type" or "kind." Since land and water use on the scale needed for solar development is much more similar to the requirements for agriculture, a more appropriate comparison might be to the per acre consumption of locally prevalent crops like cotton or alfalfa. Or – if there is a compelling reason to use human consumption as the standard – perhaps compare the solar consumption to the "per acre" water use of a typical Southwestern subdivision.

- 3-11, Table 3.1-1: The range of water use (3x) for CSP is unduly large as a result of including a very large range of capacity factors (30 percent to 60 percent) and other inputs. Water consumption should be measured relative to MWh/yr, instead of

[73] The numbers that precede each point represent the section and page number. For example 3-2,3 is from Section 3-2, page 3. Similarly F-4,11 is from Appendix F, Section 4, page 11.

MW/yr, to eliminate the confusion introduced by the very large range of capacity factors. MWh/yr comparisons would eliminate the uncertainty introduced by the wide range of capacity factors introduced by all of the technologies.

The numbers given in the draft PEIS are not well-supported and are sometimes wildly too general. Examples include the water requirements for troughs (on 3-4,24, 4.5-14.5 ac-ft/yr/MW) and for tower plants (on 3-6,21, 9 ac/MW), as well as the land requirements for PV (on 3-11, Table 3-1.1).

In addition, the estimates for land requirements tend to be notably higher than estimates found in other literature. Trough estimates seem to be based on actual plants that are in operation while estimates for the other technologies are based on proposals for plants. However, it is noted earlier in the draft PEIS that developers tend to submit proposals for dramatically more land than they actually plan to use. For example, the table below details examples of acreage estimates drawn from a recent literature search.

	Parabolic Trough	**Power Tower**	**Dish / Stirling**	**PV**
Required area (acres/MW)	6	5	4	4
Total water usage (Gal/MWh)	718	718	1	1
From: "Study of Potential Mohave Alternative/Complementary Generation Resources", Sargent & Lundy Global Energy Consulting (Reviewed and Approved by David W. Cohn), February 2006				

- 3-6, 5 – Acreage per MW capacity for Towers can vary widely with the size of the plant, the amount of storage and the tower height. It would probably be best to use a range here.
- 3-6, 19 – The estimated water consumption cited here for power tower plants is the same as for trough plants. This is not only contradicted elsewhere in the document, but most engineers and analysts generally assume that tower plants will require less water per unit output because of their higher operating efficiencies resulting from higher operating temperatures.

- 3-9, 7 – The “excess heat” addressed in this line comes from higher levels of solar concentration, not higher levels of operating efficiency.
- 3-11, 5 - This is a "per power block" number and is an economic optimum, not a physical limitation. It is likely that the economic and technical limitations that cause these economic optima today will change as the technology improves and electricity becomes more expensive.
- F-3, 29 - Quote from text: “One inherent limitation of solar energy technologies is that power can be produced only when the sun is shining.” This is incorrect. It would be correct to say, "energy can be collected only when the sun is shining." But plants with storage can still generate electricity without direct solar thermal input.
- F-4, box – Quote: "the more insolation, the higher temperature". We suggest that this sentence be deleted since it is not necessarily true. A good example is Colorado’s San Luis Valley that has very strong insolation levels because of its high altitude and dry climate, but the high altitude also brings lower ambient temperatures.
- F-7, 5-8 – The description of Organic Rankine Cycle engines (ORCs) is problematic. We recommend that the BLM rewrite this section keeping the following points in mind.
    - No analogy to steam cycles is ever mentioned. ORCs use exactly the same thermodynamic cycle but with a working fluid typically better suited to lower temps.
    - Low temperature Rankine cycles rarely have efficiencies much above 20%. A thermal efficiency of 85% for a Rankine cycle of any sort is a wildly atypical result. At the very least a citation is required to support this statement.[74]
    - There are numerous reasons that conventional power plants use steam – vs. organic fluids -- as their working fluid. This introduction ignores these, and as a consequence would leave the reader wondering why all plants aren’t ORCs?

[74] It may be that the author picked up a “2nd Law” efficiency number by mistake. This is a measure of how well a cycle performs relative to an “ideal cycle” at that same temperature range. However, this type of efficiency rating is NOT comparable to the other efficiencies cited in the draft PEIS.

  - ORCs also require cooling, just like steam turbine generators (STGs). The reason that they don't typically use wet cooling is that they are usually so small that wet cooling would be too costly to justify.
  - F-16,40 – This section describes the "intrinsic benefits of ORC engines" This type of engine is neither new nor innovative. It has a variety of important and well-understood applications, typically for smaller and lower-temperature situations. Solar plants are not limited to the low temperatures that require the use of organic working fluids. It is an advantage to be able to have high enough temperatures and large enough plants to use steam. This is why the operating and proposed plans are all designed to use steam cycles and not ORCs.

- F-8, 43 – This material appears dated. There are not many faceted glass mirrors being installed today because they are too expensive. Curiously there is no mention of polymer membranes, e.g. SkyFuel's ReflecTech.
- F-12,1 – Although this statement is technically true, large tanks for HTF or TES must have containment basins (this is a standard design feature for all large industrial tanks). Salt is easily cleaned up once it freezes (which happens at typical ambient temperatures). Clean up of leaks of organic HTF from existing plants is routinely handled by off-site incineration.
- F.2.2.2.1 (F-14, 23) – The discussion of the CFLR technology seem overly optimistic. We recommend that this discussion include a careful analysis of the proponents' claims, and an examination of the technical hurdles facing this technology.
- F-19, 19 – The term 'solar multiple' is used here but doesn't seem to ever be defined. We recommend that, as part of the more general discussion of solar technologies recommended in Section I above, this be included in a glossary of important solar engineering terms.
- F-19, 26 – The statement is made that plants with TES can produce power during peak loads during times when power is more valuable to system operators and that this "may result in a somewhat higher cost of electricity for consumers". This statement does not make sense since peak power from a solar system is likely to be much LESS costly than the conventional peak power sources such as combustion turbines. This should lead to <u>lower</u> costs to consumers.

- F-20, 8 - Good discussion of capacity factor and the relationship between solar multiple (still yet to be defined), TES capacity and nameplate capacity of power block. This is a critical design characteristic of CSP systems and should be introduced very early and given some prominence. This also is closely related to the concept of normalizing system characteristics to energy output rather than design capacity.
- F-22, text box – The listing of 'Structures and Improvements' is missing the power block facility, which can run 10,000 sq ft. or more. The comparison does include this facility (F-23, 18)
- F-23, 10 – Overestimates a production of 600,000 MWh/yr from a 26.5% capacity factor. These numbers are not internally consistent.
- F-35, 1 - Promoters of CLFR claim a benefit of this technology will be the ability to achieve higher temps than trough technologies, not lower. This would increase operating efficiencies and decrease water consumption.
- F-40, 27 – The sentence "practical limitations exist as to the length of time heat can be stored in molten salt" is very misleading. The limit is not in the length of time heat can be stored, which is very long, but optimizing the size of the tanks to the hours available for full production from the storage. This economic optimization time, in the American southwest, is roughly 6 hours. In other situations this optimum will change dramatically.
- F-41, 5 - This is an amazingly confusing way to present this material. In fact, the challenges with using salt as the HTF fall into 3 categories.
    1) Materials challenges caused by:
        - Higher temperatures, and
        - Corrosion
    2) Increase in parasitic power losses resulting from:
        - Higher viscosity, and
        - Freeze prevention
    3) Increases in maintenance costs caused by all of the above.

Materials issues like these can probably be addressed pretty successfully, although there will likely be some additional capital cost. However, the parasitic power losses are largely intrinsic

and are unlikely to go away. The maintenance issues are probably amenable to some reduction through long-term "learning" and optimization of maintenance procedures.

- F-43, 11 – As with the ORC, this is an unusually high number that at least needs a citation. Manufacturers will often claim to hit 60% in their top-of-the-line combined cycle plants. A claim of 80% First Law conversion efficiency needs a citation, at least.
- F-45, 1 – Incorrect claim and use of standard terminology. Using fuel combustion as the heat source for a Stirling engine does not make it an internal combustion engine. (By this token steam locomotives would also have been internal combustion engines!). "Internal combustion" refers to combustion happening inside the engine proper, e.g. within a cylinder. Stirling engines are intrinsically limited to using external heat sources. (See also 51,17-23)
- F-57, 31 - Asserting that multi-junction cells will ultimately be the most cost-effective choice for utility-scale PV plants seems like an overstatement at this point in the development of the technology. (see also 60,13-15, and 62,19-23)

Inconsistencies

- In Chapter 1, dish/Stirling solar technologies are categorized with photovoltaic (PV) technologies, as opposed to concentrating solar power (CSP), because these two do not use steam and a power block in electrical production, however after this point dish/Stirling is viewed as a CSP technology because it utilizes the concentration of the sun's thermal energy.
- Ch3 – The acreage and water specifications are internally inconsistent between Ch3 and the Appendices. For example, power tower water consumption is stated to be 800 gal/hr/MW in Ch 3 (3-6,21) and 600 gal/MWh in Appendix F (F-34,26).
- Novel and untested technologies are described in glowing terms with few – or no -- technological hurdles mentioned. For example:
  - Molten salt as a heat transfer fluid (HTF) (Intro-42, 14).
  - Compact linear Fresnel reflectors (CLFR) discussed as a "variation" on trough technology (3-3, 39).
  - Thermal energy storage (TES) for dish technologies (3-6, 40).
  - Organic liquids for cooling loops (3-14, 10).
- No mention of solar tower (chimney) despite project applications in Arizona and a PPA with Southern California Public Power Authority.

- Appendix F asserts that multi-junction cells "will be the choice" of utility-scale PV plants then later observes that current plants tend to be thin-film and that thin-film will be the likely choice for future "grid-connected central plants" (F-62,19; F-59,29-31; F-60,13-16).
- Inconsistent definition of “maximum” plant sizes - PV/dish vs. trough/tower. The “maximum” sizes listed for the trough and tower technologies are, in fact, economically optimal sizes based on current costs and heat transfer considerations. There are already several proposals for projects that consist of multiple adjacent trough and/or tower plants (3-11, Table 3-1.1).

APPENDIX VII. CRITERIA FOR USE IN IDENTIFYING AND PRIORITIZING LANDS TO BE CONSIDERED FOR NEW OR EXPANDED ZONES

Bureau of Land Management (BLM) lands offer some of the most intact landscapes, wildlife habitats and corridors, and important ecological resources in the United States. In addition, these landscapes include important cultural resources and historic sites and are part of a mix of lands managed by federal and state agencies for their recreational, scenic, historical and cultural values such as units of the National Park System, national monuments, and national wilderness areas.

Human understanding of the arid ecosystems that are most often of greatest value for solar energy development is limited and evolving. While thought of by some as "wastelands," these landscapes are, in fact, rich in biodiversity and in historic, cultural, scenic, and recreational value. For these reasons, a deliberate and thoughtful process for their review for solar energy development based upon a set of criteria that recognize the important values of these landscapes is required.

The following is an approach for screening lands with high solar energy potential that meet appropriate standards for energy potential, aspect, and slope (relative to the technology to be employed) to ensure the protection of important ecological, historic, cultural, and scenic values. In addition to applying these screens in assessing the potential acceptability of sites for solar energy zones, early and frequent stakeholder involvement should be employed to ensure that those who have an interest in the candidate lands and/or may be affected by their potential development are an integral part of the process.

To evaluate new and potential solar energy zones as a part of the Modified Solar Energy Zone Alternative presented in our comments of the Draft Solar Energy Programmatic Environmental Impact Statement, we recommend a two-step process that employs a Landscape-Scale Assessment Approach followed by the identification and prioritization of Least Conflict Lands within identified landscapes deemed to have high solar energy zone potential.

The overarching goal of this approach is to ensure that zones where solar energy projects are located are areas of high energy potential that, when developed, will not adversely affect the persistence, distribution and diversity of the ecoregional biota and all its natural components and processes today and in the future while protecting important historic, cultural, scenic, and recreational values.

The **Landscape-Scale Assessment** should:

- Contain an evaluation of both public and private lands in a geographic area that makes sense from a biological perspective.
- Clearly define objectives that guide selection of conservation targets/goals, structure of impact analyses, and the targets and measures selected for monitoring.
- Evaluate the impact of various planning scenarios on the biodiversity and ecosystem function goals as well as on the target species.

- Implement and improve upon existing conservation and recovery plans
- Result in a conservation reserve design that best satisfies this suite of biological goals while also meeting renewable energy goals.
- Include an adaptive management framework.

From an ecological perspective, the following must be considered as part of developing the reserve design under the landscape-scale assessment:

- Locations that support sensitive biological resources, including federally designated and proposed critical habitat; significant populations of federal or state threatened and endangered species; significant populations of sensitive, rare and special status species; and rare or unique plant communities.
- Areas of Critical Environmental Concern (ACEC), Wildlife Habitat Management Areas, proposed Habitat Conservation Plans and Natural Community Conservation Planning Conservation Reserves.
- Landscape-level biological linkage areas required for the continued functioning of biological and ecological processes and allow for long-term shifts in distribution of native species in response to climate change.
- Wetlands and riparian areas, including the upland habitat and groundwater resources required to protect the integrity of seeps, springs, streams or wetlands.
- Areas that support a geophysical or other ecosystem process upon which sensitive biological resources depend.

The DPEIS states that "all BLM-administered lands are not appropriate for solar energy development." The landscape-scale assessment should incorporate and build off of the following areas, which have already been identified as by the DPEIS as inappropriate for solar energy development based on environmental criteria:[75, 76]

- All ACECs, including Desert Wildlife Management Areas (DWMAs) in the California Desert District.
- All critical habitat areas (designated and proposed) for listed species under the Endangered Species Act of 1973 (as amended).
- All areas where the applicable land use plan designates no surface occupancy.
- All areas where there is an applicable land use plan decision to protect lands with wilderness characteristics.
- All Special Recreation Management Areas, developed recreational facilities, and special-use permit recreation sites (e.g., ski resorts and camps).

[75] Note: some of these overlap with the key ecological considerations identified above.

[76] While this list is focused on ecological considerations, a comprehensive list of cultural resource areas to be avoided was laid out in a letter sent to Secretary Salazar and California Governor Schwarzenegger dated June 29, 2009. This includes areas with a high density of cultural resources requiring inventory and consultation, Historic Property/National Register, National Historic Landmarks and Landmark Districts, National Historic Districts and Archaeological Districts, High potential route segments and high potential historic sites of National Historic Trails, National Historic and Scenic Byways, sacred sites identified by an Indian tribe in accordance with Executive Order 13007, and traditional Cultural Properties eligible for or listed in the National Register of Historic Places or an equivalent state register.

- All areas where solar energy development proposals are not demonstrated to be consistent with the land use management prescriptions or where the BLM has made a commitment to take certain actions with respect to sensitive species habitat, including but not limited to sage-grouse core areas, nesting habitat, and winter habitat; Mohave ground squirrel habitat; and flat-tailed horned lizard habitat.
- All right-of-way (ROW) exclusion areas designated in applicable plans.
- All ROW avoidance areas designated in applicable plans.
- All areas where the land use plan designates seasonal restrictions.
- All desert tortoise translocation sites identified in applicable land use plans.
- Big game migratory corridors identified in applicable land use plans.
- Big game winter ranges identified in applicable land use plans.
- Research Natural Areas.
- Lands categorized as Visual Resource Management Class I or II (and, in Utah, Class IIIb).
- National Recreation Trails and National Back Country Byways.
- National Historic and Scenic Trails, including a corridor of 0.25 mi (0.4 km) from the centerline of the trail, except where a corridor of a different width has been established.
- National Historic and Natural Landmarks.
- Within the boundary of properties listed in the "National Register of Historic Places" and additional lands outside the designated boundaries to the extent necessary to protect values where the setting and integrity is critical to their designation or eligibility.
- Areas with important cultural and archaeological resources, such as traditional cultural properties and Native American sacred sites, as identified through consultation.
- Wild, Scenic, and Recreational Rivers, including a corridor of 0.25 mi (0.4 km) from the ordinary highwater mark on both sides of the river, except where a corridor of a different width has been established.
- Segments of rivers determined to be eligible or suitable for Wild or Scenic River status, including a corridor of 0.25 mi (0.4 km) from the ordinary high-water mark on either side of the river.
- Old-growth forest.
- Lands within a solar energy development application found to be inappropriate for solar energy development through an environmental review process that occurred prior to finalization of the PEIS.

Finally, the following areas should be avoided when identifying areas for directed development because of the high degree of conflict that a proposal for development would cause:

- Lands purchased for conservation including those conveyed to the BLM.
- Proposed Wilderness Areas, proposed National Monuments, and Citizens' Wilderness Inventory Areas.
- Locations directly adjacent (within 2 miles) to National or State Park units.

In addition to screening landscapes in accordance with the above criteria and guidance, we further recommend that a second step in this analysis should be to identify and **prioritize Least Conflict Lands** within the landscapes identified above (or, under some circumstances, though rarely, outside of those larger landscapes) in the selection of future solar energy zones by guiding

zones to areas consisting of or dominated by land types and landscapes that reflect the following characteristics:

- Lands that have been mechanically disturbed, i.e., locations that are degraded and disturbed by mechanical disturbance:
    - Lands that have been "type-converted" from native vegetation through plowing, bulldozing, or other mechanical impact often in support of agriculture or other land cover change activities (mining, clearance for development, heavy off-road vehicle use).
- Public lands of comparatively-low resource value located adjacent to degraded and impacted private lands on the fringes of BLM-managed land. This combination of public and private lands could allow for a conjunctive use area, allowing for the expansion of renewable energy development onto private lands.
- Brownfields and other contaminated or previously contaminated sites identified by the Environmental Protection Agency's RE-Powering America's Land Initiative.
- Idle or underutilized industrialized sites.
- Existing transmission capacity and infrastructure are typically in place.
- Locations adjacent to urbanized areas.
- Locations that minimize the need to build new roads.
- Locations that could be served by existing substations.
- Areas proximate to sources of municipal wastewater for use in cleaning.
- Locations proximate to load centers.
- Locations adjacent to federally-designated corridors with existing major transmission lines with capacity to carry the additional electricity generated by proposed facilities.
- Locations that have been repeatedly burned and invaded by fire-promoting non-native grasses.

It is important to recognize that several ongoing processes have employed this or a similar approach in attempting to guide future solar energy development to locations that would achieve the objectives of high solar energy potential that, when developed, will not adversely affect the persistence, distribution and diversity of the ecoregional biota and all its natural components and processes today and in the future, nor negatively affect important cultural, historic, and scenic values. The Desert Renewable Energy Conservation Plan in California and the Arizona BLM's Restoration Design Energy Project provide two examples of processes that employ many of these criteria and guidelines to identify potential zones for future solar energy development. These processes warrant further development and, perhaps, should be replicated in other western states.

APPENDIX VIII. SURVEY OF BEST MANAGEMENT PRACTICES FOR RENEWABLE ENERGY DEVELOPMENT

BEST MANAGEMENT PRACTICES FOR SITING, DEVELOPING OPERATING, AND MONITORING RENEWABLE ENERGY IN THE WEST: A CONSERVATIONIST'S GUIDE

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Introduction

Development of renewable energy provides important benefits, enhancing our energy security and helping us shift away from climate-changing fossil fuels. Currently, the Department of the Interior is on track to permit more than 30 "fast track" wind and solar generation and transmission projects, and has committed to a performance goal of 9,000 megawatts of renewable energy by the end of 2011. In 2010, the Department of the Interior approved a dozen renewable energy projects on public lands, including nine commercial-scale solar energy initiatives that combined will create more than 7,000 construction and operational jobs and produce almost 4,000 megawatts of energy, enough to power 1.2 million American homes. So far eight of eleven western states have adopted Renewable Portfolio Standards requiring utilities to generate 15 to 25 percent of energy from renewable sources. It is likely that we will have 50,000 MW of new wind power online in the U.S by 2020.

Our early experiences with permitting and constructing wind and solar energy facilities has shown us that meaningful renewable energy development will only happen at the pace and scale needed to transition away from fossil fuels if we do it "smart from the start." That means establishing a proactive approach to siting and conservation strategies that protect wildlife and wildlands while allowing renewable energy deployment to ramp up. We here explore this approach and refer to it as a set of Best Management Practices (BMPs) for renewable energy siting and development.

These Best Management Practices for renewable energy siting and development and the justification for them draw on scientific, peer-reviewed research. While primarily written for conservationists who are working to positively affect renewable energy development in the West, this manual can also help to better inform wind and solar energy developers, stakeholders and decision-makers about the link between wind and solar energy development and responses by wildlife and the functions of their habitat. The goal is to enable developers, wildlife agencies, conservationists and other stakeholders to work with a consistent knowledge base and set of appropriate technical questions and well-established guidance to assess a given project location and develop wind and solar energy in a way that is smart from the start for wildlife and their habitats.

These BMPs were designed to guide conservationists to positively affect renewable energy siting and development outside of the built environment. The potential of distributed small-scale generation, such as rooftop solar, to meet Western energy needs is strong. Yet, there are literally hundreds of proposed wind and solar projects – outside of the built environment – on the books for the coming decades, and we must work to ensure that these developments are done right with regard to wildlife and their habitats. While decreasing energy demand in our cities through efficiency and other demand-side measures can reduce the need for large scale renewable energy facilities to be built outside of our cities, this strategy is not addressed in this document.

Similarly, this document does not address geothermal development. Instead, we refer readers working on geothermal plant siting and environmental issues to a number of other useful publications, including the Bureau of Land Management's and U.S Forest Service's Programmatic Environmental Impact Statement for geothermal leasing in the Western U.S (BLM and USFS 2008a and b), the Wilderness Society's publication on geothermal development on public lands (TWS 2010), the Geothermal Energy Association's *A Guide to Geothermal Energy and the Environment* (GEA 2007), and the U.S. Department of Energy's *Geothermal Power Plants – Minimizing Land Use and Impact* (USDOE 2008).

The guidelines and BMPs are not designed to address transmission beyond the point of connection to the transmission system. The national grid and proposed smart grid system are beyond the scope of this document. For wildlife and habitat related issues regarding transmission impacts and transmission planning, we refer readers to *Smart Lines: Transmission for the Renewable Energy Economy* (Resource Media and WRA 2008) the Western Electric Coordinating Council's Environmental Data Task Force's *Preliminary Environmental Recommendations for the Transmission Planning Process* (WECC 2011), and the Avian Power Line Interaction Committee's *Suggested Practices for Avian Protection on Power Lines* (APLIC 2006).

Use of these BMPs and this guidance document by the conservation community and others should help ensure that potentially adverse impacts to most species of concern and their habitats present at renewable energy project sites would be reduced. These BMP's and this manual will evolve over time as additional experience, monitoring and research becomes available on how to best minimize wildlife and habitat impacts from wind and solar energy projects. As such, we plan to continue work with industry, developers, the conservation community and other stakeholders and states to evaluate, revise and update these BMPs and guidance document on a periodic basis.

Laws and Regulations for Renewable Energy Development

Numerous laws, federal regulations, state ordinances, and Executive Orders either directly or indirectly provide management, regulatory and policy guidance for siting, zoning for, and permitting large scale solar and wind energy development on both private and public lands. We give an overview here sufficient to help conservationists have a general understanding of these processes. Much more detailed guidance on these topics has been published by the National Wind Coordinating Collaborative (2002), American Wind Energy Association (2008) and Stoel Rives, LLP (2010). While these guidelines for understanding zoning, siting, regulatory, and permitting process are primarily focused on wind energy and wind energy developers and utilities, they are still useful for conservationists trying to affect these processes for both solar and wind development.

Executive and (Interior) Secretarial Orders relating to energy development

On May 18, 2001, President George W. Bush issued Executive Order (E.O.) 13212, "Actions to Expedite Energy-Related Projects," which established a policy that federal agencies should take appropriate actions, to the extent consistent with applicable law, to expedite projects to increase the production, transmission, or conservation of energy.

In 2009, the Secretary of the Department of the Interior Ken Slazar issued Secretarial Order Number 3285, which acknowledged the need to identify suitable areas for both wind and solar development on Interior Lands. This was a great stride toward creating a policy framework capable of tackling the challenge inherited by the Obama administration, when it inherited an Interior bureaucracy focused on oil and gas development, and faced with hundreds of wind and solar permits languishing in a queue dating back to 2002. This Secretarial Order was clarified in 2010 by Secretarial Order 3285A1 which ordered the Department of the Interior to identify and prioritize locations best suited for solar development.

Inter-agency MOUs

Also in May of 2001, the President's National Energy Policy Development Group (NEPDG) recommended to the President, as part of National Energy Policy, that the Departments of the Interior, Energy, Agriculture, and Defense work together to increase renewable energy production (NEPDG 2001). In July 2001, the Departments created an interagency task force to address the issues associated with increasing renewable energy production on federal lands (USDOE and USDOI 2002). The task force developed a Memorandum of Understanding (MOU) among the U.S. Department of Energy, U.S. Department of the Interior, U.S. Department of Agriculture, U.S. Environmental Protection Agency, Council on Environmental Quality and the members of the Western Governors' Association to establish a framework for cooperation between western states and the federal government to address energy problems facing the West and to facilitate renewable energy production.

Energy Legislation

On August 8, 2005, the President signed into law the Energy Policy Act of 2005 (P.L. 109-58). Section 211 of the Act states, "It is the sense of the Congress that the Secretary of the Interior should, before the end of the 10-year period beginning on the date of enactment of this Act, seek to have approved non-

hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity."

Renewable Energy on Tribal Lands

Tribal lands are not federal public lands or part of the public domain, but are rather retained by Tribes or set aside for tribal use pursuant to treaties, statutes, court orders, executive orders, judicial decisions, or agreements. Thus, Tribal lands are not subject to the controls or restrictions set forth in federal public land laws. Tribes manage Indian lands in accordance with tribal goals and objectives, within the framework of applicable laws. Tribal coordination is important not only in federal discussions about renewable energy. Many tribal traditional lands and tribal rights extend outside federal lands onto state regulated lands. In addition, tribal interests can also be impacted in private land developments. A discussion of tribal input to all proposed solar and wind projects is important.

Bureau of Land Management

We chose to focus chiefly on the Bureau of Land Management (BLM) for this guidance document because the majority of permitted solar and wind facilities on public lands thus far have been on BLM lands. The American Wind Energy Association's Wind Energy Siting handbook (2008) addresses wind energy development on lands administered by other federal agencies, such as Bureau of Reclamation, Bureau of Indian Affairs, U.S. Forest Service, and U.S. Department of Defense. While this handbook primarily addresses siting, zoning, permitting, and regulatory issues surrounding development of wind projects, there is also applicability to solar energy development in terms of these issues and processes on a variety of federal lands.

BLM Wind PEIS and permitting. In 2005 the Bureau of Land Management (BLM) issued a Record Of Decision on the implementation of a wind energy development program and how this would affect 52 land use plans in nine states (basically by amendment). The decision (BLM 2005a) established policies and Best Management Practices for the administration of wind energy development activities and established minimum requirements for mitigation measures. The policies and BMPs were evaluated in the Final Wind Energy Programmatic Environmental Impact Statement, or PEIS (BLM 2005b). The amendments to the 52 land-use plans were to include (1) adoption of the BLM's Wind Energy Development Program policies and best management practices (BMPs), and (2) identification of specific areas where wind energy development will not be allowed.

The Record Of Decision (ROD) for the Wind PEIS explains how site-specific concerns, and the development of additional mitigation measures, will be addressed in project-level reviews, including NEPA analyses, as required. It also requires that at this site-specific level, natural resource issues and concerns must be addressed by project-specific plans, programs, and stipulations during each phase of wind energy development, and that mitigation measures protecting these resources will be required to be incorporated into project Plans Of Development. This will include incorporation of specific programmatic BMPs as well as the incorporation of additional mitigation measures contained in other, existing and relevant BLM guidance, or developed to address site-specific or species-specific concerns.

The ROD also outlines how the BLM will initiate consultation early in the process of wind development on BLM lands with the following, as appropriate and required by law: Indian Tribal governments, U.S Department of Defense, the U.S. Fish and Wildlife Service, and the State Historic Preservation Office. It goes on to say that the level of environmental analysis to be

required under NEPA for individual wind power projects will be determined at the Field Office level, will incorporate public involvement, and will include analyses of project site configuration and micrositing considerations, monitoring program requirements, and appropriate mitigation measures. The BLM also requires financial bonds for all wind energy development projects on BLM-administered public lands to ensure compliance with the terms and conditions of the rights-of-way authorization and the requirements of applicable regulatory requirements, including reclamation costs.

With the decision to implement the Wind Energy Development Program, the BLM Interim Wind Energy Policy (BLM 2002) was replaced by a new policy in 2006 (Wind Energy Development Policy IM 2006-16) that incorporates the programmatic policies and BMPs evaluated in the PEIS. That framework was carried forward and supplemented by BLM's revised Wind Energy Development Policy IM 2009-043, issued in 2008. One major revision in the 2008 IM compared to the 2006 IM allows wind energy development in an Area of Critical Environmental Concern (ACEC) to the extent that it would be consistent with the management prescriptions of that individual ACEC.

On BLM lands, wind project development usually proceeds in two phases: (1) a site testing and monitoring phase and (2), if the wind resource is viable, a project construction and operation phase. BLM permits all wind facilities, whether for testing and monitoring or for project construction and operation, through use of Right of Way (ROW) grants authorized by the Federal Land Policy and Management Act ("FLPMA"), 43 U.S.C. §§ 1701-1784. BLM offers three types of BLM wind energy ROWs: a Site Specific Grant for Testing and Monitoring ("Site-Specific Grant"), a Project Area Grant for Testing and Monitoring ("Project Area Grant"), and a Development Grant for project construction and operation.

BLM Solar PEIS and permitting. In 2007, the BLM developed and issued a Solar Energy Development Policy (BLM Instruction Memorandum 2007-097*)* to establish procedures for processing Right of Way applications. This policy was updated in 2010 by two more detailed policies (BLM Instruction Memorandums 2010-141 and 2011-003). In accordance with these policies, the BLM currently evaluates solar energy ROW applications on a project-specific basis. In 2010 the BLM issued a Draft Programmatic Environmental Impact Statement (PEIS) (BLM 2010a) in order to develop a new Solar Energy Program. The PEIS will support utility scale solar energy development on BLM-administered lands that would be applicable to all pending and future solar energy development applications upon execution of the Record of Decision (ROD) and implementation of this decision through amendment of relevant BLM land use plans in six western states.

The Solar PEIS evaluated the potential effects of establishing the solar energy program elements and strategies across the six-state study area (California, Nevada, Utah, Arizona, Colorado and New Mexico). The analysis informed BLM's decision to identify 24 Solar Energy Zones within the six-state study area. The BLM decided that these 24 locations are best-suited for utility-scale solar energy development (i.e., high resource value and low [or limited] resource and/or environmental conflicts). In addition to presenting general design features to best develop solar resources, the Solar PEIS identified specific design features for projects developed within individual Solar Energy Zones. However, the PEIS also explains that the BLM's proposed solar energy program would require that site-specific and species-specific issues be addressed during individual project reviews. These evaluations would tier to the programmatic analyses in the Solar PEIS and the decisions implemented in the resultant ROD.

BLM regulations pertaining to both solar and wind energy. In the case of either wind or solar development on BLM lands, BLM Manual 6840 "Special Status Species Management" (BLM 2001) would require that appropriate survey, avoidance, and mitigation measures would need to be identified and implemented prior to any construction activities to avoid impacting any sensitive species or the

habitats on which they rely. Also, in areas that experience ground disturbing activity, it is important to remember that the BLM Standards and Guidelines for Healthy Rangelands (CITE), still apply to those lands. This is particularly important to consider when, for example, wind turbines are erected in an active grazing allotment.

Also, in February 2011 the BLM issued three related Instruction Memoranda (IM 2011-59, 2011-60 and 2011-61) to reiterate and clarify existing BLM National Environmental Policy Act (NEPA) policy to assist offices that are analyzing externally-generated, utility-scale renewable energy right-of-way applications. It includes examples and guidance applicable to renewable energy right-of-way applications that supplement information in the BLM's NEPA Handbook (H-1790-1). Utility-scale renewable energy projects are distinct from many other types of land and realty actions due to their size and potential for significant resource conflicts, as well as the priority that has been placed on them by the Department of the Interior.

Special section – amending BLM land use plans in light of Solar and Wind Programmatic Environmental Impact Statements

Land use plans are important in siting renewable energy facilities. Such a planning process provides a means to comprehensively address the diverse topics described in this best management practice guide. In most settings, compliance with approved land use plans is a legal requirement for a large project on public lands. This section summarizes the theoretical basis for land use, and describes planning practices using BLM lands as an example.

Theoretical Basis for Land Use

The American Planning Association (AMP) defines a land use plan as "an adopted statement of policy, in the form of text, maps, and graphics, used to guide public and private actions that affect the future. A plan provides decision makers with the information they need to make informed decisions affecting the long-range social, economic, and physical growth of a community" (AMP 2006). Given goals or end results that are desired, planners determine the best means for achieving them.

According to BLM's Land Use Planning Handbook 1610-1 (BLM 2005c), BLM's land use plans are created within a process that follows the model for rationality described in planning theory. Planning theory views rationality as a central rule in planning methodology (Faludi 1973). In this context, rationality means the power of reason as opposed to faith and values to define a central fact (Teitz 1985). Rationality in planning is the standard used to measure decisions (Faludi 1985) and provides political legitimacy to the process (Weaver et al. 1985). Plans must guide and result in action otherwise they are outside the realm of testable rationality (Johnson 1985). Perhaps more than other fields, land use planning has embraced rationality as a core concept (Teitz 1985). Rationality in planning involves standard technical processes for management, control of specialist information, and a clear system of rules, monitoring, and analysis (Weber 1947).

In the field of planning, ethics play a role in evaluating the objectivity and legitimacy of any completed plan. The American Planning Association (2009) has developed a code of ethics that should be followed in land use planning:

- A planner must provide full, clear and accurate information to citizens and decision makers.
- A planner must exercise independent professional judgment on behalf of the clients, employers, and public.
- A planner must report any actual, apparent or reasonably foreseeable conflict between the planner and the client or employer.

Planning Practices on BLM Lands
Since more of the future renewable energy proposed for the West will occur on BLM lands than on any other government agency's land, this section will focus on the application of land use planning by BLM.

BLM's land use planning process is guided by BLM Handbook 1601-1 (BLM 2005c). Required by an act of Congress (FLPMA, 43 U.S. C. 1711-1712), BLM land use plans are called Resource Management Plans (RMPs). BLM's handbook directs land use plans to establish goals and objectives for resource management (desired outcomes) and measures to achieve these goal and objectives (management actions and allowable uses). Such RMPs are to make decisions that guide future land management actions and site specific implementation (BLM 2005).

Three types of land use plan decisions are described in BLM's planning handbook – desired outcomes, allowable uses, and management actions. These can be defined as follows:

- **Desired outcomes** are "expressed in terms of specific goals and objectives." Goals are "broad statements of desired outcomes (e.g. maintain ecosystem health and productivity, . . .)." Where possible, objectives are quantifiable and measurable within an established timeframe for achievement.

- **Allowable use** identifies the type of use and where it is allowed or prohibited. The resulting plan then defines which areas allow, prohibit, or put limitations on actions or uses.

- **Management actions** include restoration or administrative designations for areas such as Areas of Critical Environmental Concern or Research Natural Areas. For example, where undesired habitat conditions may not correct themselves on their own, management actions may be necessary to restore habitat to land use plan objectives. Any action that BLM takes must by law conform with an approved land use plan. Conformance means that the action is consistent with the terms, conditions, and decision of the plan (43 CFR 1601.0-5(b). For example, a decision to permit a drilling operation in an area where the approved RMP prohibits surface activity would be considered not to conform with the plan. If the plan does not mention the action, then it is assumed to be in conformance. This legal requirement creates an incentive in BLM to limit the number of acres where management actions are prohibited.

In practice, BLM has defined planning more narrowly than its handbook describes. Many of BLM's RMPs focus primarily on one of the three types of decisions: allowed actions. For example, BLM's RMP for the Kemmerer area in southwest Wyoming has excellent potential for renewable energy facilities, especially wind power. The Kemmerer RMP outlines land use decisions of the allowed use type; therefore, to describe "allowed uses" for wind energy production, this plan presents preferred wind power development sites and exclusion areas. In considering renewable energy, most BLM land use plans provide "avoidance areas" and "exclusion areas" for wind energy. These avoidance areas are areas with important or sensitive resource values and thus will be excluded or avoided (BLM 2005).

In 2008, the state of Wyoming developed a sage grouse management plan that identified sage grouse core areas based on best available information on sage grouse use. These core areas are designated so as to prohibit surface disturbing activities, including the installation of renewable energy facilities (Fruedenthal 2009). Endorsed by the U.S. Fish and Wildlife Service, this planning alternative recommends no new surface disturbance in these areas. BLM's state director found it appropriate for BLM to "base our

management strategy on these core areas" (Simpson 2008). But in the Kemmerer RMP issued in 2010, BLM did not designate these core areas as development avoidance or prohibition areas. Instead this plan allows, in fact encourages in some sage grouse core areas, surface disturbing development. The Kemmerer RMP's preferred areas for renewable energy overlap about half of the sage grouse leks identified in the planning process. 154,396 acres are excluded from wind power which is 5% of all lands BLM manages in this area. BLM promised to address sage grouse issues on a case by case basis but not in the land use plan.

Neither the draft nor approved plan explains the decision process that lead to the final land use decision issued in the Kemmerer RMP. The justification for the plan's preferred areas for renewable energy remains hidden to the public and no rational basis for this decision is given. When a decision seems to conflict with the objective rational basis presented in the plan, political power hidden from view is a likely factor. Where power relations are unbalanced, negotiations tend to lead to co-option of the weaker party where no mediated negotiations occur (Forester1989). In the case of the Kemmerer RMP, it would seem that some power had more influence than either the BLM state director or the Governor in planning where to promote renewable energy.

Other Applicable Federal Laws

For all solar and wind projects on federally managed lands, issuance of land use permits and right-of-way authorizations by the relevant federal agency does not relieve the applicant of obtaining any and all other permits and authorizations that may be required for the proposed project, and abiding by various federal laws and acts, many of which also apply on private lands. A multitude of laws have sections that are applicable to the siting, development, permitting, and operation of large scale wind and solar energy, and therefore also provide a foundation for the Best Management Practices described in this document. Below is a list of the most important of these laws, with a brief description of how each may apply.

- *The National Environmental Policy Act (NEPA)* (42 U.S.C. §§ 4321-4370f). NEPA will be triggered by the developer's need for a federal permit or approval, siting of the project on federal lands, accessing a federally owned transmission line, or being eligible for federal grants for the project. Depending on the type of actions and the potential for impacts, the federal agency involved at the development site may have to prepare an Environmental Assessment or Environmental Impact Statement for the project before it can act. The NEPA process requires public involvement in identifying issues to be considered and in commenting on the agency's analysis. Also, under NEPA various alternatives for the project must be assessed before carrying out an action that may significantly affect the integrity of the land and its uses. And, potential cumulative impacts must be assessed[77]. The reviewing agency may use the results of the NEPA review (a Record of Decision or a Finding of No Significant Impact or a Categorical Exclusion) to clarify requirements for mitigation and monitoring to address the project's environmental impacts.

- *The Endangered Species Act (ESA)* (16 U.S.C. § 1536(a)(2) requires that agencies insure that permitting large scale solar and wind development "is not likely to jeopardize the continued

[77] Cumulative impact analysis should include determining which species of concern or their habitats within the landscape are most at risk of significant adverse impacts from renewable development in conjunction with other reasonably foreseeable significant adverse impacts. The magnitude and extent of the impact on a resource depends on whether the cumulative impacts exceed the capacity for resource sustainability and productivity. (USFWS 2010a).

existence of any endangered species or threatened species or result in the destruction or adverse modification" of critical habitat of such species. The U.S Fish and Wildlife Service has primary responsibility for terrestrial and freshwater organisms protected under the Act. To insure that there is no harm to federally listed species, the developer will need to consult with the USFWS under section 7 of the Act. To be in compliance with the ESA, the developer or relevant agency might have to write a Biological Assessment if there are any predicted impacts of the project to a federally listed species, and the U.S. Fish and Wildlife Service, which typically administers the ESA, would then write a Biological Opinion is response to the Biological Assessment. Unlike NEPA, the ESA has the authority to actually stop a project based on a potential taking of endangered species or habitat (while NEPA only requires analysis of impacts).

- *Federal Noxious Weed Act* -- Public Law 93-629 (7 U.S.C. 2801 et seq.; 88 Stat. 2148), enacted in 1975, established a Federal program to control the spread of noxious weeds.

- *The Federal Land Policy and Management Act* (FLPMA) as amended (43 U.S.C. 1701 et seq.) recognizes the value of public lands and provides a framework in which they can be managed in perpetuity for the benefit of present and future generations. FLPMA defined BLM's mission as one of multiple use. Under FLPMA, the BLM is authorized to grant Right of Ways on BLM land for solar and wind installations.

- *The Migratory Bird Treaty Act,* as amended (16 USC 703-712), implements a variety of treaties and conventions among the United States, Canada, Mexico, Japan, and Russia. This treaty makes the take, killing, or possession of migratory birds, their eggs, or nests unlawful, except as authorized under a valid permit. Most of the bird species reported from the 11 western states are classified as migratory under this act. The USFWS maintains a list of migratory birds protected by the MBTA. In addition, Under E.O. 13186, each federal agency that is taking an action that has or is likely to have negative impacts on migratory bird populations must work with the USFWS to develop an agreement to conserve those birds. The protocols developed by this consultation are intended to guide future agency regulatory actions and policy decisions.

- *The Bald and Golden Eagle Protection Act* (16 USC 668-668d) provides for the protection of both bald and golden eagles by prohibiting take unless allowed by permit.

- *The Clean Water Act* (33 USC 1251-1387) governs impacts to water resources. The Clean Water Act has a broad goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. Among other things, the Act establishes the basic structure for regulating discharges of pollutants into the waters of the United States and managing polluted runoff. In particular, wind energy projects may be subject to Water Quality Certification under Section 401 of the CWA and permit requirements under Sections 402 and 404 of the CWA.

State Permitting, Siting and Regulation of Renewable Energy

Extensive discussions have been taking place around the country on the issue of siting wind and solar energy facilities. A number of states – both those new to renewable power development and those already familiar with it – have expressed strong interest in the approaches that other states use when considering the siting of wind and solar power plants. Federal, state and local governments have long governed siting and permitting of energy facilities in the United States. Now, states have begun to develop siting guidelines, model ordinances, statutes, and checklists that address specific issues that are frequently raised in siting and permitting solar and wind energy facilities.

Jurisdiction over siting energy facilities varies from state to state. In some states, siting authority rests with a local branch of government. In these cases, county commissions, planning and zoning boards, or other local government departments are responsible for conditioning and approving wind farms and other energy facilities. Other states retain primary siting authority at the state level. Often other state regulatory agencies are involved in permitting processes. For example, when wildlife or other environmental issues arise, a state environmental protection agency may become involved.

Most state guidelines dealing with specific siting issues make reference to post-construction monitoring to ensure that no threatened or endangered species, nor their habitats, are affected by development of wind or solar energy. In most cases, state guidelines call for applicable authorities to consult with agencies charged with implementing the Endangered Species Act and other habitat protection requirements. Not all state approaches call for consideration of non-wildlife environmental issues, such as visual, noise, and construction-related effects. Others set clear limits on allowable levels of state influence in these areas. In most cases, granting of stormwater management permits for construction activities will be issued by a state's environmental quality department. Still other permits such as conditional use permits, building permits, and encroachment permits are handled at the County level, usually with a county planning and zoning department, but we will not go into detail on that level of planning in this guidance document.

In summary, the regulatory process for siting and permitting wind or solar energy projects varies widely from state to state. Both the American Wind Energy Association's Wind Energy Siting Handbook (2008), and the National Wind Coordinating Collaborative State Siting and Permitting of Energy Facilities Fact Sheet (2006) discuss the typical state-level and local regulatory frameworks that a wind developer is likely to encounter, and go into more detail on these state-level processes than we can go into here. "The Law of Wind" (Stoel Rives 2010) similarly gives good guidance on siting and permitting wind facilities on the state and local level. And "Lex helius: The law of solar energy" (Stoel Rives 2009) does the same for solar facility permitting. A particularly helpful guidance document for wind and solar projects on BLM lands was released by the BLM in November 2010 (BLM 2010c). This document, "Best Management Practices and guidance manual: Desert renewable energy projects", is an excellent source for developers wading through the federal regulatory process for siting on public lands, for both the pre-application and post-application periods.

Typical Steps in Wind and Solar Permitting Process

Pre-application. During the pre-application phase, project developers often meet with nearby landowners, community leaders, environmental groups, and other potentially affected interests. This acquaints the developer with their initial concerns and allows the developer to respond to questions regarding the project. In some jurisdictions, the project developer is required to hold public meetings or submit a public notice regarding the project during this phase. At this stage, pre-NEPA preliminary environmental screening analysis is a good idea, since this pre-NEPA analysis is often reviewed by potential investors as they evaluate the feasibility and risks associated with a proposed project and how much capital may be required.

Application review. For most agencies, the application review begins when the project developer files a permit application. Any NEPA-related environmental assessment and review would occur during this stage. The public has an opportunity to participate in this stage, through public scoping and comments periods associated with the preparation and publication of any NEPA documents such as Environmental Assessments and Environmental Impact Statements.

Decision-making. In its decision-making, the relevant federal agency not only determines whether or not to allow a proposed wind or solar facility to be constructed and operated (based on the application review

phase, above), but also whether environmental mitigation and other construction, operation, or decommissioning requirements are needed. This phase frequently includes one or more public hearings.

Administrative Appeals and Judicial Review. Appeals of all or a portion of a final decision are considered during the administrative and judicial review phase. The public (such as a conservation group) can be an appellant but first needs to make sure they have standing. The first avenue of appeal is directed to the decision-maker. Only after all administrative appeals have been exhausted are challenges to the decision reviewed by the courts. Appeals to the courts most frequently are directed at determining whether the permitting process was executed fairly and in accordance with the review requirements.

Permit Compliance. The permit compliance phase extends throughout a solar or wind project's lifetime, and may include inspection or monitoring to ensure that the project is constructed, operated, and decommissioned in compliance with the terms and conditions of its permit and all applicable laws.

Best Management Practices for Wildlife and Habitat for Solar and Wind Development on Western Lands

These Best Management Practices are broken up into six sections according to the species or resource affected: (i.e. raptors, or vegetation/hydrology). Each section provides recommendations for those species and resources and, afterwards, reviews research on solar and wind energy production and its impacts to lowlands and desert systems in the West using the best available science. The BMPs below are separated into "Siting BMPs", "Planning and pre-construction BMPs", "Construction/Operation BMPs", and "Monitoring BMPs." This breakdown reflects the different decision-making processes that land managers often encounter. There is an additional, seventh, section on how to address renewable energy development within the land-use planning context. These BMP's do not cover decommissioning of a site.

1.0 Siting - General

Not all lands are suitable for renewable energy development, and difficult choices will be required to minimize the environmental impacts of significantly expanded renewable energy. The following screening suggestions are an amalgamation of screening recommendations of thirteen different sources[78]. There was considerable overlap with the screening recommendations of all of these sources. We note that screening recommendations from the BLM for both wind (BLM 2005b) and solar (BLM 2010a)

[78] Sources include BLM 2005b, Clean Energy States Alliance 2006, National Wind Coordinating Collaborative 2007, Audubon 2008, Molvar 2008, Oregon Natural Desert Association 2009, BLM 2010a, The Wilderness Society (TWS) 2010, TWS et al. 2010, US Fish and Wildlife Service 2010a, Wyoming Game and Fish 2010, Wyoming Outdoor Council 2010, American Bird Conservancy 2011.

were also incorporated into this list and these specific guidances are indicated by an asterisk.[79] Based on this comprehensive collection of all other renewable screening guidances we could locate, categories of land that should be prioritized for wind and solar development include:

- Lands identified by the BLM in the 2010 Solar Programmatic Environmental Impact Statement (PEIS) as Solar Energy Zones* (BLM 2010a). By guiding projects to zones that have already been analyzed in the PEIS, BLM will be able to rely on some of the environmental analysis already conducted, making project-specific environmental evaluation and development of any needed mitigation measures faster. Further, because the zones have been selected for their low conflicts with other resources and uses, opposition to projects that leads to extended conflicts will be reduced. By reducing the time required to approve projects and the conflicts with stakeholders, project approvals will cost less if they are built in the already identified Solar Energy Zones. In addition, because projects are likely to be located closer to existing roads and transmission lines, there will be fewer costs associated with constructing new supporting infrastructure. Further, because these projects are in areas that have fewer conflicts with natural and cultural resources, there should be fewer costs associated with design adjustments and mitigation measures to address potential damage to other values (TWS 2010).
- Lands that have been previously degraded or disturbed, such as fallow or abandoned agricultural fields, landfills, reclaimed mine sites or any tract of land that has resulted in "type-conversion" from native vegetation through plowing, bulldozing or other mechanical impact.
- Private lands of comparatively low resource value, or public lands of comparatively low resource value located adjacent to degraded and impacted private lands, which would allow for the expansion of renewable energy development onto private lands.[80]
- Brownfields and contaminated or previously-contaminated sites, including abandoned mines.[81]
- Oil, gas and coalbed methane fields.
- Privately owned feedlots and lands currently in agricultural production[82]
- Locations adjacent to urbanized areas. This can also provide jobs for local residents often in underserved communities, while also minimizing workforce commute and associated greenhouse gas emissions.
- Locations that minimize the need to build new roads.*
- Locations that could be served by existing substations.

[79] BLM's Wind energy Programmatic Environmental Impact Statement (BLM 2005b) also states that "additional areas of land may be excluded from wind energy development on the basis of findings of resource impacts that cannot be mitigated and/or conflict with existing and planned multiple use activities or land use plans."

[80] Private lands development offers tax benefits to local government. Also, in a Netherlands study, van den Berg (2008) found that respondents with direct economic benefits (such as private land owners siting wind farms on their properties) were more accepting of wind turbines from visual and noise perspectives. This suggests that siting turbines on private lands may entail greater acceptance as landowners realize direct benefits while the public does not perceive direct compensation for the development of utility-scale wind projects on public lands.

[81] This can also revitalize idle or underutilized industrialized sites.

[82] The National Wind Coordinating Collaborative (2002) considers agriculture as "a wind-compatible resource." Because wind developments typically take less that 2% of the land out of agricultural production and yield additional sources of revenue, they may be especially attractive to private agricultural landowners (Molvar 2008). In addition, crop fields support a monoculture of non-native vegetation and tend to provide ecologically impoverished fauna and low biodiversity. In general, bird fatalities at sites located in agricultural croplands have been at the lower end of the spectrum (Erickson et al. 2003, Molvar 2008).

- Locations proximate to load centers.
- Locations with adequate access to transmission lines.*

Categories of land to be prioritized for avoidance include:

- Units of the National Landscape Conservation System, including National Parks, National Monuments, National Wildlife Refuges, Wild and Scenic Rivers, National Conservation Areas, and designated Wilderness areas.*
- Special federal land management designations, such as Areas of Critical Environmental Concern (ACECs),* Desert Wildlife Management Areas (DWMAs);* Research Natural Areas (RNAs),* Outstanding Natural Areas (ONAs), and other areas that have been identified by a federal agency for the protection of important wildlife resources, ecological features, and significant historical, paleontological, and archeological resources.
- Wilderness Study Areas* and other wilderness quality lands, including USFS Inventoried Roadless Areas, areas where there is an applicable land use plan decision to protect lands with wilderness characteristics,* and other inventoried roadless areas documented by environmental groups.
- Lands that support federally threatened/endangered and candidate species, including federally designated and proposed critical habitat*, and other lands that provide important habitat for federal T/E/Candidate species, such as greater sage grouse core breeding areas (called “Sage Grouse Core Areas”).*
- “Important Bird Areas” identified by the Audubon Society
- Wild and Scenic rivers, wetlands, riparian areas and ecologically significant intermittent washes.
- All areas where the applicable land use plan designates no surface occupancy, or Right of Way Exclusion or Avoidance Areas.*
- Landscape level biological linkages, including lands in wildlife corridors, such Big Game Migratory Corridors identified in land use plans.*
- Big Game Winter Ranges identified in applicable land use plans.*
- Historic Property/National Register lands*, and cultural sites eligible for National Register* or areas with a high density of cultural resources requiring inventory and consultation.
- Lands purchased or acquired by exchange for conservation purposes including lands conveyed to the BLM.
- State wildlife management areas and state parks
- Important wildlife habitat as identified in State Wildlife Action Plans. A good example are the “Wildlife Action Plan Focus Areas” outlined in the Utah’s State Wildlife Action Plan
- Lands identified as portfolio sites in Nature Conservancy Ecoregional Plans or as “core areas” in regional Conservation Area Designs or Wildlands Network Designs.

2.0 BMPs for Siting, Constructing, Operating and Monitoring Wind and Solar Development on Western Lands

All Best Management Plans outlines below apply to both large scale wind and solar developments, unless specifically stated that it applies to one or the other.

2.1 BEST MANAGEMENT PRACTICES FOR WILDLIFE – GENERAL

The Siting, Planning/Pre-construction, Construction/Operation, and Monitoring BMPs for wildlife, below, are an amalgamation of BMP's gathered from numerous different sources.[83]

2.1.1 ***Siting BMPs for Wildlife***

- For wind facilities, place turbines in such a way to minimize fragmentation of large contiguous tracts of wildlife habitat, and to avoid wildlife migratory pathways and known travel corridors.
- For both wind and solar installations, avoid development in big game winter and parturition ranges.
- For both wind and solar installations, avoid development in core areas, linkages and portfolio sites identified in Nature Conservancy Ecoregional plans or other conservation areas designs or reserve designs.
- For both wind and solar installations, avoid siting in important, sensitive, or unique habitats in the vicinity of the project (i.e., away from riparian habitats, streams, wetlands, drainages, or other critical wildlife habitats). See below on surveys that may be needed to identify these important wildlife areas.

Planning and Pre-construction BMPs for Wildlife should include pre-construction evaluation conducted at a potential solar and wind energy sites, which can help indicate whether a renewable power development is likely to cause wildlife impacts at levels of concern, help determine sites to avoid, and help to design a less impactful project. The pre-construction surveys should use scientifically sound, peer reviewed research protocols to determine how wildlife use a proposed project area. The estimation of displacement risk requires an understanding of animal behavior in response to a project and its infrastructure, and a pre-construction estimate of presence/absence of species whose behavior would cause them to avoid areas in proximity to turbines, roads and other components of the project. Adjust siting and facility design based on the results of these studies to reduce potential impacts to the animals. Following are our recommended preconstruction and operation BMPs:

- Consult with the state fish and game agency to determine locations of species of concern other special-status species identified by the agency in past surveys.
- Conduct surveys for federally listed and state-protected animal and plant species, as well as for other species of concern such as other special-status species identified by the state fish and game agency. Submit survey protocols to the USFWS and appropriate lead State Fish and game agency agencies for review, comment, and approval. Most listed species have required protocols for detection (e.g., the black-footed ferret).
- Relate wildlife use to site characteristics. This requires that samples of wildlife use also measure site characteristics thought to influence use (i.e., covariates such as vegetation and topography) in relation to the location of use. The statistical relationship of wildlife use to these covariates can be used to predict occurrence in unsurveyed areas during the survey period and for the same areas in the future.
- Consult with the state fish and game agency to determine the locations of crucial ungulate habitats and migration corridors.[84]
- Pre-construction studies should be sufficiently detailed in order to create maps of special status species habitats (e.g. wetlands or riparian habitat, and large, contiguous tracts of undisturbed

[83] Sources include BLM 2005a, BLM 2005b, Clean Energy States Alliance 2006, California Energy Commission 2007, BLM 2008, Molvar 2008, ONDA 2009, Wyoming Outdoor Council 2009, Arizona Game & Fish Dept. 2010, BLM 2010a, U.S Fish & Wildlife Service 2010a, Wyoming Game and Fish 2010.

[84] Studies are needed to determine whether the presence of wind turbines on crucial seasonal ranges will adversely affect big game. Big game crucial ranges should be avoided when siting wind plants, but if crucial ranges are implicated we recommend that wind companies monitor radio-collared animals for at least two years pre and post-construction.

wildlife habitat) as well as other local species movement corridors (e.g., deer, elk, pronghorn) that are used daily, seasonally, or year-round.

2.1.3 Construction and Operation BMPs for Wildlife

- Minimize project disturbance area (footprint) as much as possible.
- If lights on auxiliary buildings are deemed necessary, they should be motion-activated and downcast (avoid side-casting light) to reduce light pollution and to prevent disturbing or attracting wildlife.
- Minimize roads and other infrastructure. Use existing roads whenever possible. If new access roads and ways are needed, avoid gravel roads if possible and instead rely on dirt tracks and jeep trails constructed by cross country travel. Use road surfacing, road sealant, soil bonding, and stabilizing agents if needed on non-paved surfaces that are non-toxic to wildlife.
- Avoid constructing energy infrastructure during critical wildlife seasons such as breeding, nesting, and parturition seasons.[85] Within 2 miles of crucial migration corridors, wind power facility construction activities should occur outside their period of use by wildlife.
- Minimize construction and operation related noise levels to minimize impacts to wildlife. All equipment should have sound-control devices no less effective than those provided on the original equipment. All construction equipment used should be adequately muffled and maintained.
- Avoid the use of fencing. A 6-ft chain-link fence with 2 strands of barbed wire on the top, or a woven wire/high tensile electric/barbed wire combination exclusion fence can be used around central operations and maintenance buildings. If other fencing away from central operations must be used, use a smooth bottom wire at least 18 inches off the ground to facilitate pronghorn movements. Use a smooth top wire or top rail to facilitate elk and deer movements, and to reduce avian fatalities. Spacing between the two top wires should be 12 inches to avoid entangling deer. Fences should be no higher than 40-42 inches. Minimize the length of temporary fencing.
- Use of evaporation ponds should be avoided where the water would be considered toxic to birds and other wildlife. If evaporation ponds are absolutely necessary, they should be fenced and netted, where feasible, to prevent use by wildlife. The lower 18 in. (46 cm) of the fencing should be a solid barrier that would exclude entrance by amphibians and other small animals.
- Instruct project and maintenance personnel to drive at appropriate speeds, be alert for wildlife, and to avoid harassing and/or disturbing wildlife.
- For wind energy, portions of the wind energy facility inside crucial winter ranges or migration corridors should be closed to vehicle use (and human presence must be minimized) during their period of use by wildlife.
- For wind energy, remove wind turbines when they are no longer cost effective to use or retrofit so they cannot present a collision hazard to birds and bats.

2.1.4 ***Monitoring BMPs for Wildlife***

- Conduct post construction surveys for same wildlife species of concern that pre-construction surveys were conducted for, using the same survey methods. Compare post-construction survey data to pre-construction surveys.
- Relate post-construction wildlife use to site characteristics. This requires that samples of wildlife use also measure site characteristics thought to influence wildlife use (i.e., covariates such as

[85] The Wyoming Game and Fish (2010) states that if siting within big game winter ranges cannot be avoided, suspend construction activities from November 15 – April 30, and if siting within big game parturition areas cannot be avoided, suspend construction activities from May 1 – June 15.

vegetation and topography) in relation to the location of use. Compare post-construction survey data to pre-construction surveys.

- Compare post construction survey data with post construction survey data. Manage adaptively through changes in site operation (i.e operation of turbines) if monitoring indicates that wildlife populations are no longer meeting pre-set goals for wildlife. A technical advisory committee should be established to review monitoring results and make suggestions regarding the need to adjust site operations or mitigation and monitoring requirements.

A note about designing wildlife monitoring and post-construction studies

It is important that the outcomes of monitoring tie into specific plans of action, based on whether management goals and objectives are being met. Each management objective should be essentially "tested" through monitoring methods that have been scientifically validated. Post-construction studies and wildlife monitoring that is conducted while the wind or solar project is operational need to be tied to answering basic questions about the impact of the project, or a well-defined research question. To use one example, with fatality studies at wind developments, the basic questions to answer might include (the following is summarized from USFWS 2010a):

1. What are the bird and bat fatality rates for the project? The primary objective of fatality searches is to determine the overall estimated fatality rates for birds and bats for the project. Several metrics are available for expressing fatality rates. Early studies reported fatality rates per turbine. However, this metric is somewhat misleading as turbine sizes and their risks to birds vary significantly (NRC 2007). Fatalities are frequently reported per unit capacity (i.e. MW), a metric that is easily calculated and better for comparing fatality rates among different sized turbines. Analysis of fatality data of birds and bats can also allow calculating fatality rates per turbine of all species of concern at a site when sample sizes are sufficient to do so.

2. How do the estimated fatality rates compare to the predicted fatality rates? There are a several ways that predictions can be assigned and later evaluated with actual fatality data. During the planning stages for the project, predicted fatalities may be based on existing data at similar facilities in similar landscapes used by similar species. In this case, the assumption is that use is similar, and therefore that fatalities may be similar at the proposed facility. Alternatively, metrics derived from pre-construction assessments for an individual species or group of species – usually an index of activity or abundance at a proposed project – could be used in conjunction with use and fatality estimates from existing projects to develop a model for predicting fatalities at the proposed project site.

3. How do the fatality rates compare to the fatality rates from existing facilities in similar landscapes with similar species composition and use? Comparing fatality rates among facilities with similar characteristics is useful to determine patterns and broader landscape relationships, and to provide insight into whether a project has relatively high, moderate or low fatalities. Fatality rates should be expressed on a per MW or some other standardized metric basis for comparison with other projects.

4. Do bird and bat fatalities vary within the project site in relation to site characteristics? Turbine-specific fatality rates may be related to site characteristics such as proximity to water, forest edge, staging and roosting sites, known stop-over sites, or other key resources, and this relationship may be estimated using regression analysis. This information is particularly useful for evaluating micro-siting options when planning a future facility or, on a broader scale, in determining the location of the entire project.

5. What is the composition of fatalities in relation to migrating and resident birds and bats at the site? The simplest way to address this question is to separate fatalities per turbine of known resident species (e.g., big brown bat, prairie horned lark) and those known to migrate long distances (e.g. hoary bat, red-eyed vireo). These data are useful in determining patterns of species composition of fatalities and possible mitigation measures directed at residents, migrants, or perhaps both, and can be used in assessing potential population effects.

The above example is just one way that a post-construction monitoring study can be designed, in this case focused on fatality of birds and bats at a wind facility. The underlying thread with all post-construction wildlife studies and monitoring is to set post-construction goals for wildlife, based on knowledge of general patterns of wildlife population abundance and distribution health prior to the project commencing. Measurements made and monitoring conducted post construction need to be able to tell wildlife biologists whether they are on track with ensuring that post-construction wildlife population abundances and distribution are meeting the pre-set goals. If the post-construction data collection indicates that there are impacts to a local wildlife population, an adaptive management plan needs to be developed to mitigate these impacts.

2.1.5 JUSTIFICATION FOR WILDLIFE BMPS

Solar installations and wildlife. On solar power installations, the site is typically cleared of all vegetation to allow access to the installed equipment and to prevent fires. Herbicides may be sprayed or vegetation mowed to maintain cleared zones under and around the solar fields. These facilities typically include numerous graded access roads, construction of new or expansion of existing substations, new transmission lines, and a surrounding security fence that prevents movement of wildlife through the site (Arizona Game and Fish Department 2010, Randall et al. 2010). Proposed solar projects can range in size from 100 to over 5,000 acres (Arizona Game and Fish Department 2010).

These large scale clearing and grading activities can result in the direct injury or death of wildlife that are not mobile enough to avoid construction operations (e.g., reptiles, small mammals, and young), that utilize burrows (e.g., ground squirrels and burrowing owls), or that are defending nest sites (such as ground-nesting birds). Although more mobile species of wildlife, such as deer and adult birds, may avoid the initial clearing activity by moving into habitats in adjacent areas (Hagan et al. 1996), adjacent habitats are often at carrying capacity for the species that live there and often cannot support additional biota from the construction areas (BLM 2010a). The subsequent competition for resources in adjacent habitats would likely preclude the incorporation of the displaced individual into the resident populations (BLM 2005b).

Light and noise pollution associated with solar power plants can also be problematic for wildlife. Polarized light pollution from PV panels can attract aquatic insects and other species that mistake he panels for bodies of water, potentially leading to population decline or even local extinction of some organisms (Horvath et al. 2010). Nighttime lighting for security or other reasons may negatively impact a variety of local species, many of which have developed nocturnal behavior to escape the daytime heat of the desert. In addition, solar thermal plants that employ dry cooling generate noise pollution through the use of large fans (Randall et al. 2010), which may affect local wildlife.

Some solar facilities, which use water for cooling or cleaning solar array mirrors, will have evaporation ponds on the site. Open water sources in the desert provide water subsidies to ravens and other predators that may feed on special status species (e.g., desert tortoise). In addition,

these water sources may attract wildlife to them but may also have elevated levels of harmful contaminants (e.g., TDS and selenium) that can harm many species of wildlife (BLM 2010a).

Wind installations and wildlife. On big game winter ranges, where wind farms are most likely to be sited (as opposed to higher elevation summer ranges), elk and other big game are highly susceptible to disturbance. Disturbance during this time of year can be particularly costly, since the metabolic costs of locomotion are up to five times as great when snows are deep (Parker et al.1984). To the degree that wind power facilities involve human presence in crucial ranges during the most sensitive time periods, these developments may tend to displace elk from their preferred habitats into marginal ranges, where habitat conditions may be poor or where they may be forced to compete with resident animals already at or near their carrying capacity. Several studies have shown that elk abandon calving and winter ranges in response to oilfield development (e.g. Johnson and Lockman 1979, Johnson and Wollrab 1987, Van Dyke and Klein 1996), with potential implications for utility-scale wind power development. For mule deer, Sawyer et al. (2005) found that in the Pinedale area, wellfield development caused abandonment of mule deer crucial winter ranges for years at a time, and ultimately resulted in a 46% decline in mule deer populations, while herds in undeveloped areas showed a much smaller decline over the same period; the affected population has yet to recover to predisturbance levels (Molvar 2008). Other researchers have posited that overcrowding of species such as mule deer in sub-optimal winter ranges after they have been pushed out of optimal ranges could cause density-dependent effects, such as increased fawn mortality (Sawyer et al. 2006).

Wind farms may disrupt wildlife movements, particularly during migrations. For example, herd animals such as elk, deer and pronghorn can be affected if rows of turbines are placed along migration paths between winter and summer ranges or in calving areas (NWCC (2002). One lesson learned from oil and gas development in the Piney Front elk study in Wyoming demonstrated that oil and gas development could pose a barrier to elk migration, denying herds access to crucial winter ranges (Molvar 2008). Other researchers have posited that loss of habitat continuity along migration routes would severely restrict the seasonal movements necessary to maintain healthy big game populations (Sawyer and Lindzey 2001; Thomson et al. 2005). That said, the National Wind Coordinating Collaborative (2002) points out that because wind farms affect a relatively small proportion of the land they occupy, these sorts of effects on wildlife should be minor in most cases.

Impacts to wildlife common to solar and wind installations. Both solar and wind installations have the potential to impact a variety of wildlife species through a number of means. These include direct loss of habitat from construction activities; habitat alteration as a result of soil erosion and/or introduction of non-native vegetation; construction of obstacles to migration; and indirect habitat loss as a result of increased human presence and noise. In particular, increased traffic, noise, night lighting, and other human activities can temporarily discourage wildlife from using areas around energy facilities while these projects are being constructed (NWCC 2002).

Both large scale wind and solar installations can serve to fragment wildlife habitat (BLM 2005b, BLM 2010a). Habitat fragmentation is defined as the separation of a block of habitat for a species into segments, such that the genetic or demographic viability of the populations surviving in the remaining habitat segments is reduced (e.g. Dobson et al. 1999, Willyard et al. 2004, Dixon et al. 2007). Site clearing, access roads, transmission lines and turbine tower arrays remove habitat and displace some species of wildlife, and may fragment continuous habitat areas into smaller, isolated tracts (USFWS 2010a). Habitat fragmentation is of particular concern when species require large expanses of habitat for activities such as breeding and foraging. Consequences of isolating local populations of some species include decreased reproductive success, reduced genetic diversity, and increased susceptibility to chance events (e.g. disease and natural disasters), which may lead to extirpation or local extinctions (Noss 1983, Harris 1984, Dobson et al. 1999). In addition to displacement, development of wind and especially solar

energy infrastructure may result in additional loss of habitat for some species due to "edge effects" resulting from the break-up of continuous stands of similar vegetation resulting in an interface (edge) between two or more types of vegetation (USFWS 2010a). The extent of edge effects will vary by species and may result in adverse impacts from such effects as a greater susceptibility to colonization by invasive species, increased risk of predation, and competing species favoring landscapes with a mosaic of vegetation (Harper et al. 2005).

Sometimes renewable energy installations require the use of fencing. Fencing may disrupt wildlife movements, entangle wildlife, and increase bird fatalities (WOC 2009, ADGF 2010).
Both wind and solar installations have the potential, during construction activities, to see increases in exotic plant species such as cheatgrass, which is known to do well with ground disturbance (BLM 2010a). The establishment of invasive vegetation could reduce habitat quality for wildlife and locally affect wildlife occurrence and abundance (BLM 2005b).

Lastly, many new solar and wind facilities in previously undisturbed, open areas will require a new network of roads to access them. A number of studies have shown that wildlife such as elk avoid roads (e.g. Grover and Thompson 1986, Rowland et al. 2000, in part because increased motorized access results in decreased elk habitat and security (Lyon 1983, Hayes et al. 2002, Rowland et al. 2005). Even songbirds are sensitive to road impacts; Ingelfinger and Anderson (2004) reported that population densities of sagebrush obligates, particularly Brewer's sparrow and sage sparrow, were reduced by 40% to 60% within a 330-ft (100-m) buffer around dirt roads at their sagebrush study sites. And with new roads can come many new problems for wildlife that can occur when there is increased access to lands that previously had limited access. These impacts can include wildlife harassment and poaching, (PBS&J 2002), and unauthorized OHV use off of these roads (BLM 2005b) (and exotic plant seeds that can hitch a ride on the knobby tires (BLM 2010a, and citations within). Even if all vehicles stay on the roads, roads are often considered to facilitate the dispersal of invasive plant species by altering existing habitat conditions, stressing or removing native plant species, and allowing easier movement by wildlife or human vectors that can unknowingly carry seeds (Trombulak and Frissell 2000).

2.2 BEST MANAGEMENT PRACTICES FOR SAGE GROUSE

The Siting, Planning/Pre-construction, Construction/Operation, and Monitoring BMPs for sage grouse, below, are an amalgamation of BMP's gathered from numerous different sources.[86]

2.2.1 *Siting BMPs for Sage Grouse for Wind Installations*

- Wind Turbines should not be located within designated Sage Grouse Core Areas.
- Wind turbines and met towers should not be sited within 5 miles of an active sage grouse lek.
- Wind turbines should not be sited within sage-grouse nesting and brood-rearing habitat, and should be sited away from other high-use sage grouse areas identified in preconstruction surveys (see below).

2.2.2 Planning and Pre-construction BMPs for Sage Grouse

- Consult with the state fish and game agency to determine locations of greater sage-grouse leks, nesting and brood-rearing habitat, and wintering areas based on past surveys.
- Use scientifically sound, peer reviewed research protocols to determine how sage grouse use a proposed project area. Be sure to determine whether the site has a resident or migratory

[86] Sources include Manville 2004, Molvar 2008, ONDA 2009, Wyoming Outdoor Council 2009, U.S Fish & Wildlife Service 2010a.

population. Adjust siting and facility design based on the results of these studies to reduce potential impacts to sage grouse.

- Populations of sage grouse at the site should be assessed by either lek counts (a count of the maximum number of males attending a lek) or lek surveys (classification of known leks as active or inactive) during the breeding season (e.g., Connelly et al. 2000). Methods for lek counts require repeated visits to known sites and a systematic search of all suitable habitat for leks, followed by repeated visits to active leks to estimate the number of grouse using them (USFWS 2010a).
- Monitor radio-tagged sage-grouse on the proposed development site for at least two years preconstruction **outside** core sage-grouse areas.
- Suitable nesting and brood rearing habitat at the site should be mapped.

2.2.3 Construction and Operation BMPs for Sage Grouse

- All transmission lines (including high-voltage DC lines) sited within 5 miles of a grouse lek should be buried
- As practicable, do not conduct surface-use activities within crucial sage-grouse wintering areas from December 1 through March 15.

2.2.4 *Monitoring BMPs for Sage Grouse*

- Post construction populations of sage grouse at the site should be assessed by either lek counts or lek surveys during the breeding season (e.g., Connelly et al. 2000).
- Monitor radio-tagged sage-grouse on the site for five years post-construction in proposed sites **outside** core sage-grouse areas.

2.2.5 JUSTIFICATION FOR SAGE GROUSE BMPS

The area within five miles of a sage grouse lek is crucial to both the breeding activities and nesting success of local sage grouse populations (Manville 2004, Molvar 2008, USFWS 2010a). Hulet et al. (1986) found that 10 of 13 hens nested within two miles of the lek site during the first year of their southern Idaho study, and 100% of hens nested within two miles of the lek site during the second year of this study. Because lek sites are used traditionally year after year and represent selection for optimal breeding and nesting habitat, it is crucially important to protect the area surrounding lek sites from impacts.

Sage-grouse have an innate aversion to vertical structures because predators such as raptors can perch and hunt from these structures (Utah Department of Natural Resources 2010). Thus, sage grouse are through to be negatively impacted by wind energy development, not so much from the standpoint of direct mortality from collisions but from displacement from favored habitats due to behavioral avoidance of tall structures like met towers and turbines. For example at the Cotterel Mountain wind project site in Idaho, there were nine known sage grouse leks on Cotterel Mountain prior to the placement of eight meteorological towers erected to measure wind velocity for a commercial wind power feasibility study (Reynolds 2004). Overall sage grouse population estimates were 59 to 72 individuals in 2004 and 2005 (Reynolds and Hinckley 2005).

In spring 2006, after the Met towers were built, the population of sage grouse on Cotterel Mountain had declined to an estimated 16 individuals and seven of nine leks were unoccupied, while sage grouse populations elsewhere in the county exhibited steady population trends in 2004 and 2005 and only a very slight dip in 2006 (Collins and Reynolds 2006). It is instructive that the Cotterel Mountain sage grouse

population crashed following installation of anemometer towers across the crest of Cotterel Mountain. With relevance for solar installations as well, transmission towers for power lines also serve as perches for hunting raptors so can also cause abandonment of sage grouse habitats through behavioral avoidance (Molvar 2008). An unpublished study found that sage grouse habitat use increased with distance (up to 600 meters) from powerlines (Braun, unpublished data, reported in Strickland 2004).

Much of what is known about the tolerance of sage grouse to industrial development derives from studies on oil, gas, and coalbed methane development. To the extent that both wind power and solar power development also involves habitat fragmentation and loss from new construction and development, road construction and subsequent vehicle traffic, human activity and noise associated with maintenance, some of the impacts recorded in the context of oil and gas development may apply to varying degrees to wind and solar power developments (Molvar 2008). For example in a study near Pinedale, Wyoming, sage grouse from disturbed leks where gas development occurred within 3 miles of the lek site showed lower nesting rates (and hence lower reproduction), traveled farther to nest, and selected greater shrub cover than grouse from undisturbed leks (Lyon 2000). Walker et al. (2007) found that coalbed methane development within two miles of a sage grouse lek had negative effects on lek attendance. Holloran (2005) found that active drilling within 3 miles of a lek reduced breeding populations, while wells already constructed and drilled within 2 miles of the lek reduced breeding populations. Both Holloran (2005) and Walker et al. (2007) documented the extirpation of breeding populations at active leks as a result of oil and gas development in the Upper Green River Valley and Powder River Basin, respectively. Lyon and Anderson (2003) found that in habitats fragmented by natural gas development, only 26 % of hens captured on disturbed leks nested within 2 miles of the lek of capture, whereas 91 % of hens from undisturbed areas nested within the same area. Based on this evidence from the oil and gas development literature, USFWS (2010a) stated, "Based primarily on data documenting reduced fecundity (a combination of nesting, clutch size, nest success, juvenile survival, and other factors) in sage grouse populations near roads, transmissions lines, and areas of oil and gas development/production (Holloran 2005, Connelly et al. 2000), development within three to five miles (or more) of active sage grouse leks may have significant adverse impacts on the affected grouse population."

The US Fish and Wildlife Service generally agrees with the prediction of wind power impacts on sage grouse, similar to those made in the reviews and studies above, stating in its recent 12-month finding of whether to list the sage grouse under the ESA, "wind power typically require[s] many of the same features for construction and operation as do nonrenewable energy resources.
Therefore, we anticipate that potential impacts from direct habitat losses, habitat fragmentation through roads and powerlines, noise, and increased human presence…will generally be similar to those …for nonrenewable energy development" (USFWS 2010b).

2.3 BEST MANAGEMENT PRACTICES FOR RAPTORS

The Siting, Planning/Pre-construction, Construction/Operation, and Monitoring BMPs for raptors, below, are an amalgamation of BMP's gathered from numerous different sources.[87] Many of the BMPs in the section following this one, "Best Management Practices for All Other Birds," also include many BMPs that are also relevant to raptors. BMP's that overlap both categories are thus included in the Birds BMP section, not this one, to avoid redundancy.

2.3 1 *Siting BMPs for Raptors for Wind Installations*

[87] Sources include the Kansas Renewable Energy Working Group 2003, BLM 2005a, BLM 2005b, The Clean Energy States Alliance (2006) , California Energy Commission 2007, Molvar 2008, Oregon Natural Desert Association 2009, U.S Fish & Wildlife Service 2010a, Wyoming Outdoor Council 2010.

- Avoid placement of turbines in raptor nesting concentration areas, and also downwind of raptor nesting sites (where strong winds can carry fledglings with underdeveloped flight skills straight into turbines)
- Configure turbines so as to avoid landscape features known to attract raptors, such as cliff and rim edges, canyons, and passes in ridgelines. Turbines should be set at least 100 m. back from cliff and rim edges.
- Turbines should be clustered rather than widely spaced, and rows should be oriented parallel to known bird movements rather than perpendicular to them.
- Sites that potentially have high concentrations of prey such as prairie dog towns should be avoided, as well as high-use raptor areas identified in preconstruction surveys (see below).
- Minimize soil disturbance in areas between turbines

2.3.2. ***Planning and Pre-construction BMPs for Raptors***

- Consult with state fish and game agency to determine active raptor nesting locations, flight pathways, foraging areas, and concentration areas based on past surveys in the area.
- Pre-construction raptor surveys should follow science based, peer-reviewed protocols and comply with BLM, USFWS,[88] and state Game and Fish guidelines. For wind projects, the USFWS (2010a) guidelines recommend that raptor surveys should be done using point counts (e.g. Reynolds et al. 1980). These surveys should also collect vertical as well as horizontal data (such as flight height) to identify levels of activity within the rotor-swept zone.
- If potential impacts to breeding raptors are a concern on a project, raptor nest searches during the breeding season within the project site and within one mile of the project site are also recommended. These surveys provide information to predict risk to the local breeding population of raptors, and for micro-siting decisions.
- Nests of raptors located during surveys should have non-disturbance buffer zones delineated around them.

2.3.3 Construction and Operation BMPs for Raptors for Wind Power

- Use state-of-the art tubular, non-latticed turbines, to reduce the ability of raptors to perch on turbines.
- Avoid placing external ladders and platforms on tubular towers that can be used by birds as perches or nest sites.

2.3.4 ***Monitoring BMPs for Raptors***

- Post-construction raptor surveys[7] should be done using point counts (e.g. Reynolds et al. 1980). These surveys should also collect vertical as well as horizontal data (such as flight height) to identify levels of activity within the rotor-swept zone.
- Survey for active raptor nests within one mile of the project area. Compare with pre-construction baseline data to allow for estimation impacts and determining mitigation requirements.
- Compare post construction survey data with post construction survey data. Manage adaptively through changes in site operation (i.e operation of turbines, cut-in speeds of turbines) if monitoring indicates that raptor populations are no longer meeting pre-set goals. A technical advisory committee should be established to review monitoring results

[88] We refer readers to the USFWS (2010a) Wind Turbine Guidelines Advisory Committee Policy Recommendations and Guidelines for further guidance on designing and implementing pre and post wind facility construction monitoring plans and surveys for raptors.

and make suggestions regarding the need to adjust site operations or mitigation and monitoring requirements.

2.3.5 JUSTIFICATION FOR RAPTOR BMPS

There are indications that raptors are sensitive to wind turbines, partly because they tend to fly at heights within the blade sweep area (Kingsley and Whittam). At Tehachapi Pass in California, Anderson et al. (2004) found that red-tailed hawks, American kestrels, and great horned owls showed the greatest risk of collision of all bird species, and Osborn et al. (2008) concluded that raptors, along with waterflowl, were found to have the highest risk of turbine collision in Minnesota. Moreover, it does not appear that raptors make behavioral adjustments to wind power facilities that reduce fatality rates over time. Indeed, Smallwood and Thelander (2005) found that per-capita risk of raptor fatalities for individual birds actually increased over 15 years of study at Altamont Pass in California, even as raptor densities decreased.

Siting turbines in canyons and passes increases the risk of fatalities for migrating raptors. In Montana, Harmata et al. (2000) found that more migrating raptors passed over valleys and swales than over high points; while migrating birds tended to avoid passing over high points during headwinds, low passes received greatest use by migrating raptors overall. In general, raptors are known to concentrate along ridge tops, upwind sides of slopes, and canyons to take advantage of wind currents that are favorable for hunting and traveling, as well as for migratory flights (Barrios and Rodriguez 2004, Hoover and Morrison 2005, Manville 2009). Smallwood and Thelander (2005) found that golden eagles at the Altamont Pass facility were killed disproportionately by turbines sited in canyons. At Altamont Pass, Hoover (2002) noted that golden eagles preferred to use narrow corridors that transect large hills. Also at Altamont pass, Hoover and Morrisson (2005) reported that raptor kiting behavior was most frequently observed on steep windward slopes, and selected for the tallest peaked slopes; slopes where this behavior occurred had a disproportionate amount of red-tailed hawk mortality. In the context of the Foote Creek Rim project in Wyoming, Johnson et al. (2000) also reported higher than expected raptor use of rim edge habitats. And the same was noted for raptor use at the Columbia Wind Farm #1 in Washington state (Erickson and Johnson 1999).

There is more to doing wind energy smart from the start for raptors than just siting the wind turbines properly. It is also important to ensure that ground disturbance between turbines is minimized A disturbed ground surface can be more suitable for burrowing animals, many of which are attractive prey for raptors and other predators (NWCC 2002). It is thus possible that disturbed soils on a site can lead to luring more raptors towards the turbines than would happen otherwise.

The Altamont pass wind site in California has been intensely studied (e.g. Smallwood Thelander 2005 & 2008) and is often cited as an example of how wind turbines cause direct mortality to a variety of birds, especially raptors. However, since this wind facility was built (in the 1980's) it has largely been dismissed as a good example of how projects should be sited and built, due to its location (right in the middle of avian migratory pathways), and the types of wind turbines in operation (fast-moving blades, lattice towers, etc). Since the days of Altamont, studies in other wind resource areas have shown that bird collisions are not a critical problem at most wind development areas (NWCC 2002) and have led researchers to conclude that fatalities at the level seen at Altamont Pass may be unique (see studies by Thelander and Rugge 2000, and Anderson et al. 2002). A 2010 summary of the research on wind turbine interactions with birds (NWCC 2010) underscores this in the statement, "Studies have indicated that relatively low raptor (e.g., hawks, eagles) fatality rates exist at most wind energy developments with the exception of some facilities in parts of California."

2.3 BEST MANAGEMENT PRACTICES FOR ALL OTHER BIRDS

The Siting, Planning/Pre-construction, Construction/Operation, and Monitoring BMPs for all birds, below, are an amalgamation of BMP's gathered from numerous different sources.[89]

2.4 1 *Siting BMPs for Birds*

- Avoid known avian concentration areas such as wetlands, riparian areas, roosts, nesting colonies, staging areas, and known daily movement flyways (e.g., between feeding and resting or breeding areas), as well as away from high-use areas identified in pre-construction surveys (see below).
- Avoid siting turbines in areas prone to fog, mist, low visibility, or low cloud ceilings.

2.4.2. *Planning and Pre-construction BMPs for Birds.*

- Gather information from the Natural Heritage Program database or comparable State Game and Fish database with past location information on sensitive bird species. Consultations should occur with the state fish and game agency to determine sensitive bird species nesting locations, foraging areas, and concentration areas.
- Field surveys should follow science-based, peer-reviewed protocols and comply with BLM, USFWS,[90] and state Game and Fish guidelines. Surveys should occur, if possible, in conjunction with the state fish and game agency. Sampling should either be distributed randomly or systematically throughout the area of interest.
- For wind developments, daytime and nighttime avian surveys[91] during the spring and fall migration season should be conducted to determine use of the proposed project area, and daytime avian surveys during the breeding season for at least two years prior to construction.
- For wind developments, the USFWS (2010a) recommends that avian surveys include surveys that can be assumed to give indices of abundance in the area, such as weekly point-counts (e.g. Reynolds et al. 1980) or transect surveys[92] (similar to Schaffer and Johnson, 2008). These methods are most useful for pre- and post-construction studies to quantify avian use of the project site by habitat, determine the presence of species of concern, and to provide a baseline for assessing displacement effects and habitat loss (USFWS 2010a). Standardized protocols for estimating avian abundance from these survey methods are well-established and should be consulted (e.g., Dettmers et al. 1999).
- Nests of special status bird species located during surveys should have non-disturbance buffer zones delineated around them.

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[89] Sources include National Wind Coordinating Collaborative 2002, the Kansas Renewable Energy Working Group 2003, BLM 2005a, BLM 2005b, Canadian Wildlife Service 2006, the Clean Energy States Alliance (2006), California Energy Commission and California Dept of Fish and Game 2007, BLM 2008, ONDA 2009, Arizona Game and Fish Department 2010, U.S Fish & Wildlife Service 2007 and 2010a, WOC 2010, American Bird Conservancy 2011.

[90] We refer readers to the USFWS (2010a) Wind Turbine Guidelines Advisory Committee Policy Recommendations and Guidelines for further guidance on designing and implementing pre and post wind facility construction monitoring plans and surveys for birds.

[91] An index of migration activity can often be obtained by diurnal counts of a nocturnal migrating species during their daily stop-over (CESA 2006).

[92] The Clean Energy States Alliance (2006) posits that in grasslands and shrub-steppe where passerines are the primary target, belt transects may be most appropriate for estimating species occurrence and relative abundance.

2.4.3 Construction and Operation BMPs for Birds

- Avoid construction activities during mating and nesting seasons, and within (buffered) areas of active nests identified during pre-construction surveys.
- Design lighting to prevent skyward projection of lighting that may disorient night migrating birds. Sodium vapor lights, widely used for streetlights and security lighting, should never be used at energy facilities because they have been shown to attract night-flying birds.
- Bury electrical collector lines in a manner that minimizes additional surface disturbance (e.g., along roads or other paths of surface disturbance). Overhead lines can be considered in cases where burying lines would result in disturbance of significant habitat, but must be balanced with the concern for creation of additional bird perching opportunities.[93]
- Ensure that all above-ground low and medium voltage lines, transformers, or conductors comply with Avian Power Line Interaction Committee (APLIC) standards (APLIC 2006), including the use of deterrents.
- There should be no permanently installed high intensity lighting at the facility. Site lighting should be "off" unless needed for specific tasks.
- For wind facilities, place and configure meteorological towers to minimize impacts on birds. Sonic detection and ranging should be used instead of meteorological towers if possible. If met towers are used, un-guyed met towers are preferable. Un-guyed towers should be tubular, not latticed (latticed towers attract perching and nesting birds). If un-guyed met towers cannot be used (such as on temporary met towers), guy-wires should be fitted with recommended bird-deterrent devices, such bird flight diverters, or other high visibility marking devices.
- For wind facilities, for turbines that require lights for aviation safety, use a minimal number of simultaneously flashing white or red lights, unless otherwise requested by the FAA. Lights with short flash durations that emit no light during the "off phase" should be used—those that have the minimum number of flashes per minute and the briefest flash duration allowable.
- For wind facilities, make sure that wind turbine arrays are built with the tops of blades positioned lower than nearby ridgetops. Birds usually maintain altitude after crossing ridgetops (Mabee et al. 2006), suggesting that ensuring that arrays are lower than ridgetops could result in lower rates of mortality for migratory birds.
- For wind facilities, use tubular, non-latticed turbines to reduce the ability birds to perch on turbines.
- For wind facilities, spacing between turbines should be greater than 200 meters.

2.4.4 ***Monitoring BMPs for Birds for Wind Facilities***

- For wind facilities, conduct surveys[94] to determine fatality rates of birds, including carcass searches and associated scavenger removal trials (to determine how many dead birds are removed from the site by scavengers) and searcher efficiency trials (to determine the proportion of dead birds actually found by searchers). These trials are important for adjusting fatality estimates.
- For wind facilities, surveys should be conducted during the spring and fall migration periods and during the breeding season for at least two to three years post-construction.
- Compare post construction survey data with post construction survey data. Manage adaptively through changes in site operation (i.e operation of turbines, cut-in speeds of turbines) if monitoring indicates that bird populations are no longer meeting pre-set

[93] The USFWS (2010a) states that "Overhead lines may be acceptable if sited away from high bird crossing locations…such as between roosting and feeding areas or between lakes, rivers, prairie grouse and sage grouse leks, and nesting habitats. Overhead lines may be used when the lines parallel tree lines, employ bird flight diverters, or are otherwise screened so that collision risk is reduced.

[94] Another good source for designing scientifically rigorous post construction avian monitoring studies is "Studying wind energy/bird interactions: a guidance document" (NWCC 1999).

goals. A technical advisory committee should be established to review monitoring results and make suggestions regarding the need to adjust site operations or mitigation and monitoring requirements.

2.4.5 JUSTIFICATION FOR BIRD BMPS

Both solar and wind installations have the potential to impact a variety of avian species through a number of means. These include direct mortality from collisions, loss of habitat from construction activities; habitat alteration as a result of soil erosion and/or introduction of non-native vegetation; destruction of the nests of ground-nesting birds; increased predation by providing additional perches for raptors; and indirect effects as a result of increased human presence, noise, or motion of operating wind turbines (NWCC 2010). Some of these habitat alteration effects and other indirect effects can lead to avoidance or abandonment of certain habitats, reduced nesting/breeding density, loss of refugia, habitat unsuitability, and behavioral effects (Stewart et al. 2004, 2007). There are some cases where the impacts of habitat disturbance at a wind farm may actually be more egregious than the impacts of the turbine blades, such as the case of the Stateline Wind Resource Area, where impacts on grassland nesting passerines may have been largely due to the direct reduction of habitat from turbine pads and roads and the temporary disturbance of habitat between turbines and road shoulders, rather than due to collisions with turbines (Erickson et al. 2003b).

Principal sources of noise during construction activities for large scale solar and wind facilities includes truck traffic, operation of heavy machinery, and occasionally blasting (i.e. to level or place foundations). The most adverse impacts associated with construction noise could occur if critical avian life-cycle activities are disrupted (e.g., mating and nesting, NWCC 2002). If birds are disturbed sufficiently during the nesting season to cause displacement, then nest or brood abandonment might occur, and the eggs and young of displaced birds would be more susceptible to cold or predators (BLM 2005b). Much of the research on wildlife-related noise effects has focused on birds, and has shown that noise may affect territory selection, territorial defense, dispersal, foraging success, fledging success, and song learning (e.g., Reijnen and Foppen 1994; Foppen and Reijnen 1994; Larkin 1996).

Wind turbine arrays have the potential to be major sources of bird mortality.[95] The National Wind Coordinating Collaborative estimated that on average, a typical wind turbine kills about two birds per year (NWCC 2002). Erickson et al. (2001) reported than in a California study, 78% of mortalities were songbirds protected by the Migratory Bird Treaty Act, while only 3.3% of bird mortalities were unprotected, such as non-native species like pigeons or starlings. At Wyoming's Foote Creek Rim wind facility, 92% of bird mortality between 1998 and 2002 was comprised of passerines, as opposed to raptors or waterfowl (Young et al. 2003).

[95] The Altamont pass wind site in California has been intensely studied (e.g. Smallwood Thelander 2005 & 2008) and is often cited as an example of how wind turbines cause direct mortality to a variety of birds. However, since this wind facility was built (in the 1980's) it has largely been dismissed as a good example of how projects should be sited, due to its location (right in the middle of avian migratory pathways), and the types of wind turbines in operation (fast-moving blades, lattice towers, etc). Since the days of Altamont, studies in other wind resource areas have shown that bird collisions are not a critical problem at most wind development areas (NWCC 2002) and have led researchers to conclude that fatalities at the level seen at Altamont Pass may be unique (see studies by Thelander and Rugge 2000, and Anderson et al. 2002, NWC 2010).

Fatality rates for birds due to direct impact with turbines vary. Birds have relatively poor hearing. To make a comparison, human ears can detect wind turbines at roughly twice the distance as birds can (Dooling 2002). Both resident and migratory birds are involved in collisions, although resident birds may have a higher probability of colliding with turbines than migrants, given that residents tend to fly lower and spend more time in an area than migrants (Janss 2000). Birds typically migrate at altitudes of 500 to 2,500 feet, well above the top of turbine blades in most locations (NWCC 2002, NWCC 2010). Therefore, collisions with wind turbines during actual migratory flights should be, and appear in actuality to be, rare. However, studies have shown that songbirds are vulnerable to colliding with wind turbines during poor weather conditions that force them to lower altitudes (Erickson et al. 2001; Johnson et al. 2002; Manville 2009). And, Osbourne et al. (1998) noted that 75% of the bird mortality at the Buffalo Ridge Wind Resource Area occurs during migration periods.

The USFWS (2010a) points out that collision risk to individual birds at a particular wind energy facility may be the result of complex interactions among species distribution, relative abundance, behavior, weather conditions (e.g., wind, temperature) and site characteristics. Put simply, the relative abundance of a bird species does not predict the relative frequency of fatalities per species (Thelander and Rugge 2000). For example, collision risk for an individual may be low regardless of abundance if its behavior does not place it within the rotor-swept zone. If individuals frequently occupy the rotor-swept zone but effectively avoid collisions, they are also at low risk of collision with a turbine (e.g. ravens). Alternatively, if the behavior of individuals frequently places them in the rotor-swept zone, and they do not actively avoid turbine blade strikes, they are at higher risk of collisions with turbines regardless of abundance. For a given species, increased abundance increases the likelihood that individuals will be killed by turbine strikes, although the risk to individuals will remain about the same. The risk to a population increases as the proportion of individuals in the population at risk to collision increases (USFWS 2010a). However, to date, the only known concern regarding population effects of wind energy on birds has arisen in the Altamont Pass wind development project, where poor siting of turbines resulted in greater than normal fatality of birds (NWCC 2002, NWCC 2010). It is also noteworthy that the number of birds killed in wind developments is substantially lower relative to estimated annual bird casualty rates from a variety of other anthropogenic factors including vehicles, buildings and windows, power transmission lines, communication towers, toxic chemicals including pesticides, and feral and domestic cats (Erickson et al. 2001; NAS 2007; Manville 2009).

Lattice rather than tubular turbine designs has been shown to be detrimental to birds, because Lattice support towers offer many more perching sites for raptors than do monopole towers, and hence may encourage high raptor occupancy in the immediate vicinity, or rotor swept area, of wind turbines (Orloff and Flannery 1992; NAS 2007). At Altamont pass, lattice turbine types were associated with a higher mortality rate than all other turbine types combined (Orloff and Flannery 1992). These same findings at multiple sites have led many researchers to call for tubular rather than latticed designs for turbines at wind farms.

Reduced visibility because of fog, clouds, rain, and darkness may be a contributing factor in collisions of birds with wind turbines. For example as many as 51 of the 55 collision fatalities (93%) in a study at the Buffalo Ridge Wind Resource Area (WRA) may have occurred in association with inclement weather such as thunderstorms, fog, and gusty winds (Johnson et al. 2002). Sometimes birds experience reduced ability to detect moving blades because of motion smear. Howell et al. (1991) found that increasing turbine blade visibility (alternating patterns of red and white) appeared to reduce the number of avian collisions.

Interestingly, birds are also susceptible to collisions with mirrored heliostats at solar generation facilities. At the 10-MW Solar One pilot power tower facility located in the Mojave Desert, 70 bird fatalities involving 26 species were documented during a 40-week study. 81% of the birds died from colliding

with mirrored heliostats, while the rest died from burns received by flying through standby points. The rate of mortality was estimated to be 1.9 to 2.2 birds per week. It was estimated that this represented 0.6 to 0.7% of the local population present at any given time. While this loss was considered minimal, it was concluded that larger facilities could produce nonlinear increases in the rate of avian mortality and, when coupled with the removal of large tracts of land from biological production, could be of concern with regard to the ecological effects of a solar energy project (McCrary et al. 1986).

In terms of meteorological towers, studies have shown guy-wired towers can cause four times more bird mortality than towers without guy wires (Young et al. 2003), and in fact guyed towers may be more dangerous to birds than wind turbines (BLM 2005b, Wyoming Outdoor Council 2010). The Nine Canyon wind project in Washington used an unguyed meteorological tower, which resulted in no recorded bird or bat fatalities (Erickson et al. 2003a).

Often individual turbine lights span an entire wind farm. While recent studies have concluded that there is no difference in avian mortality rates between a wind farm with flashing lights vs. no lights, the International Dark Sky Association still feels that there could be an issue with nocturnal environment disruption. Non-flashing red lights have been shown to attract night-migrating birds (BLM 2005b). Quickly flashing white strobes appear to be less attractive to birds (Ugoretz 2001). The presence of lighting on some turbines might attract birds to the area and increase the potential for collision mortality at both the lit and unlit turbines (Johnson et al. 2002).

Overall, impacts of wind facilities to bats are one of the more well-studied aspects of wind energy. Reviews on the topic have been written by Erickson et al. (2001), Kunz et al. (2007a) and the National Wind Coordinating Collaborative (2010).

2.5 BEST MANAGEMENT PRACTICES FOR BATS

The Siting, Planning/Pre-construction, Construction/Operation, and Monitoring BMPs for bats, below, are an amalgamation of BMP's gathered from numerous different sources.[96]

2.5.1 *Siting BMPs for Bats for Wind Projects*

- Avoid siting turbines near bat hibernacula, breeding colonies and maternity roosts.
- Avoid siting turbines within migration corridors and flight paths among and between colonies and feeding areas
- Site turbines away from wetlands, riparian areas, and woodlands to reduce potential bat collisions
- Site turbines away from high-use bat areas identified in pre-construction surveys (see below).

2.5.2. Planning and Pre-construction BMPs for Bats for wind projects

- Conduct daytime and nighttime bat surveys during the spring and fall migration season to determine use of the proposed project area, and conduct nighttime bat surveys during the breeding season.

[96] Sources include Kuenzi and Morrison 1998, O'Farrell et al. 1999, BLM 2005a, BLM 2005b, CESA 2006, BLM 2008, Molvar 2008, ONDA 2009, Arizona Game and Fish Department 2010, NWCC 2010, U.S Fish & Wildlife Service 2010a, WOC 2010.

- Surveys should follow science-based, peer-reviewed protocols,[97] and can include acoustic, radar, and/or thermal imaging surveys to determine relative abundances and occupied habitats for bats in and near the project area prior to site selection, and foraging habitats and migration pathways used by these species.
- If acoustic surveys are done, the USFWS (2010a) recommends placing acoustic detectors on existing met towers, approximately every two kilometers across the site where turbines are expected to be sited. The Clean Energy States Alliance also recommends that this be done for one season (late summer-early fall) with acoustic detectors mounted on existing met towers at varying heights, with an attempt made to mount detectors within the proposed rotor swept area.
- Monitoring for a full year is recommended in areas where there is year round bat activity.
- Data on environmental variables such as temperature and wind speed should be collected concurrently with acoustic monitoring so these weather data can be used in the analysis of bat activity levels.
- Mistnetting is best used in combination with acoustic monitoring to inventory the species of bats present at a site, especially to detect the presence of threatened or endangered species. Efforts should concentrate on potential commuting, foraging, drinking, and roosting sites.
- Pre-construction survey efforts may be recommended to determine whether known or likely bat roosts in mines, caves, bridges, buildings, or other potential roost sites occur within the project vicinity, and to confirm whether known or likely bat roosts are occupied by bats.

2.5.3 Construction and Operation BMPs for Bats for Wind facilities

- Use no lighting on turbines unless required by Federal Aviation Administration regulations.
- For turbines that require lights for aviation safety consider "on-demand" lighting systems for turbines and met towers, such as those which use radar-based technology to allow the FAA strobe lights on wind farms to remain off at all times - unless an aircraft is detected. Alternatively, use a minimal number of simultaneously flashing white or red lights, unless otherwise requested by the FAA.
- For lighting for operation and maintenance facilities and substations, lights should be hooded downward and directed to minimize horizontal and skyward illumination. Minimize use of high-intensity lighting, steady-burning, or bright lights such as sodium vapor, quartz, halogen, or other bright spotlights
- If turbines are sited across migration routes or between roosting and feeding areas, then these turbines should have seasonal shutdowns during the migration season(s) or periods.
- Turbines should be set to have a minimum ‘cut-in’ speed of 6 meters per second to avoid the increased mortality risk to bats at slow turbine speeds.
- Focus most construction activities in either summer or winter, if possible.
- Because some studies have demonstrated that bat fatalities occur primarily on nights with low wind speed and typically increase immediately before and after the passage of storm fronts, consider shutting down some turbines during these weather conditions.

2.5.4 ***Monitoring BMPs for Bats for Wind Facilities***

[97] We refer readers to the USFWS (2010a) Wind Turbine Guidelines Advisory Committee Policy Recommendations and Guidelines for further guidance on designing and implementing pre and post wind facility construction monitoring plans and surveys for bats.

- For wind facilities, conduct weekly surveys to determine fatality rates of bats.[98] Fatality studies should also conduct carcass removal and searcher efficiency trials using accepted methods (Anderson 1999, Morrison et al. 2001, Kunz et al. 2007a, Arnett et al. 2007, NRC 2007).
- For wind facilities, bat surveys should be conducted during the spring and fall migration periods and during the breeding season for at least two to three years post-construction.
- Compare post construction survey data with post construction survey data. Manage adaptively through changes in site operation (i.e cut-in speeds of turbines, operation of turbines during low wind nights when it is predicted to have higher bat mortality) if monitoring indicates that bat populations are no longer meeting pre-set goals. A technical advisory committee should be established to review monitoring results and make suggestions regarding the need to adjust site operations or mitigation and monitoring requirements.

2.5.5 JUSTIFICATION FOR BAT BMPS

Bats sustain potentially fatal injuries not only from turbine strikes but also from potentially deadly decompression associated with air pressure gradients cased by spinning turbines (Arnett et al. 2008, Baerwald et al. 2008). Kunz et al. (2007a) reported that bat fatalities at wind power facilities ranged from 0.8 to 53.3 bats per megawatt per year, with the highest mortality rates in forested areas. At some projects, bat fatalities are higher than bird fatalities, but the exposure risk of bats at these facilities is not fully understood (National Research Council 2007). In their literature review on patterns of bat facilities at wind energy facilities in North America, Arnett et al. 2008 noted that none of the studies they reviewed reported bat fatalities associated with meteorological towers. These findings support the contention that bats collide with spinning turbine blades and that they do not strike stationary blades or towers (Arnett 2005). Across North America, taller towers with greater rotor-swept area induce greater bat mortality rates than smaller and shorter wind turbines (Arnett et al. 2008). As the trend within the industry is toward taller wind turbines with larger propellers, it is expected that risk to bats will increase further over time.

Almost 75% of all bats killed by wind turbines nationwide are made up of three species[99] of tree-roosting, migratory Lasiurids: the foliage-roosting eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), and tree cavity-dwelling silver-haired bat (*Lasionycteris noctivagans*) (NAS 2007, Kunz et al. 2007b, Arnett et al. 2008). All three of these species have spring and fall migration periods (NatureServe 2011). Many researchers have concluded that migrating bats are at most risk of turbine collision and that resident, breeding, or foraging bats have a lower risk of collision mortality (Erickson et al. 2003, Johnson et al. 2003, Johnson and Strickland 2004, Johnson et al. 2004). The National Wind Coordinating Collaborative (2010) stated that, "all studies of bat impacts have demonstrated that fatalities peak in late summer and early fall, coinciding with the migration of many species (referencing Johnson 2005; Kunz et al. 2007a;
Arnett et al. 2008).

Jain et al. (2007) suggested that turbines located closer to wetlands may kill more bats. One thing that has been found by many researchers is that wind projects planned in or near woodlands have a greater

[98] Alternatively, Arnett (2005) recommends daily carcass searches rotating through a subset of the turbines, so that there are some carcass data coming in each day. Also, the Clean Energy States Alliance (2006) posits that initial post-construction bat mortality surveys can be done at a modest level of intensity (e.g., weekly or biweekly at a sample of turbines during the migration period) to determine a general level of bat mortality. However, if the monitoring indicates larger than expected bat fatalities, additional monitoring will be needed

[99] Arnett et al. (2008) and Miller (2008) report that the Brazilian Free-tailed Bat comprised a large proportion (41–86%) of the bats killed at developments within this species' range.

likelihood of high bat mortality rates. Some of the highest levels of bat mortality have been recorded at the Mountaineer wind power facility in the forested mountains of West Virginia, where an estimated 21 bats per night were struck (Horn et al. 2008). Fiedler (2004) reported that bat fatalities in 2004 at a wind power facility in mixed hardwood forest in eastern Tennessee were an order of magnitude greater than at 8 other facilities in the region, and blamed siting on a prominent ridgeline surrounded by forests with rocky outcrops for the higher bat mortality at this site and the Mountaineer wind farm. Johnson et al. (2004) found that turbines located near woodlands also experienced higher levels of bat activity at the Buffalo Ridge facility in southwestern Minnesota. Arnett et al. (2005) found that forested ridges pose especially high fatality risks to bats at wind facilities. In their literature review on patterns of bat facilities at wind energy facilities in North America, Arnett et al. 2008 noted that estimates of bat fatalities were highest at wind energy facilities in the eastern United States (which are often located on forested ridges), and lowest in the Rocky Mountain and Pacific Northwest regions.

Bats may be more vulnerable to mortality at wind power facilities than birds because bats seem to be attracted to operating turbines. It is possible that migrating tree-roosting species perceive turbines as possible roost trees and investigate them upon encounter (Arnett 2005, Kunz et al. 2007b, Horn et al. 2008). Others (Cryan and Brown 2007) have put forth the "mating hypothesis" in which bats will be generally attracted to the tallest prominent features in a landscape where they can meet along their migratory routes and breed. This also might explain why so many bats are killed by bars in the fall, due to these aggregation type of mating behaviors (Arnett et al. 2008). Arnett (2005) hypothesized that hoary bats may confuse turbine movements for flying insects and be drawn toward operating turbine blades. The attraction of bats to wind turbines during feeding was validated experimentally by Horn et al. (2008), who videoed foraging bats approaching and pursuing moving turbine blades and then being trapped by their vortices of air. Horn et al. hypothesized that bats investigate moving blades simply out of curiosity, because movement is mistaken as evidence of prey, or because of attractive sounds. Similarly, Kunz et al. (2007b) produced thermal images of bats attempting to land or actually landing on stationary blades. Other researchers have also noted that many turbines are located on ridge top sites where there are often elevated numbers of insect prey (Horn et al. 2008).

Some studies demonstrate that bat fatalities occur primarily on nights with low wind speed and typically increase immediately before and after the passage of storm fronts. Weather patterns therefore may be a predictor of bat activity and fatalities, and mitigation efforts that focus on these high risk periods may reduce bat fatalities substantially (Arnett etal. 2008). Scientists have hypothesized that bat fatalities could be lowered substantially by reducing the amount of turbine operating hours during low wind periods when bats are most active. This can be done by increasing the minimum wind speed, known as the "cut-in" speed, at which the turbine's blades begin rotating to produce electricity. Some researchers (Arnett et al. 2009, Baerwald et al. 2009) have tested whether or not increasing the minimum turbine cut-in speed reduces bat fatalities, and demonstrated that bat fatalities were reduced by 50 to 87%.

Overall, impacts of wind facilities to bats are one of the more well-studied aspects of wind energy. Reviews on the topic have been written by Johnson (2005), Kunz et al. (2007a), Arnett et al. (2008), and the National Wind Coordinating Collaborative (2010).

2.6 BEST MANAGEMENT PRACTICES FOR SITE HYDROLOGY (INCLUDING SOILS AND VEGETATION)

The Siting, Planning/Pre-construction, Construction/Operation, and Monitoring BMPs below are an amalgamation of BMP's gathered from numerous different sources.[100]

2.6.1 *Siting BMPs for Soils, Vegetation and Hydrology*

- If location is on BLM lands, note that BLM will prohibit the disturbance of any population of federally listed plant species.
- All structures related to the solar or wind energy facility should be sited in locations that minimize impacts on surface water bodies, ephemeral washes, playas, and natural drainage areas (including groundwater recharge areas). Siting within 100-year floodplains should be avoided
- For solar installations, ensure that there are adequate and readily available local water supplies needed for cooling. In particular, wet-cooling technology is not recommended because of the large amounts of water that is required.
- For wind facilities, locate turbines in an area that does not disrupt sand transport processes nor removes some or all of a sand source relative to nearby sand dune systems harboring listed or otherwise sensitive plant species. Projects should not armor sand sources for nearby dune systems.

2.6.2 Planning and pre-construction BMPs for Soils, Vegetation and Hydrology

- Natural Heritage Program data should be consulted to identify rare plants of state (S1, S2), and global (G1, G2, G3) rankings known to or suspected to occur on the site.
- Surveys should be done for threatened and endangered plants suspected to be at the site.
- Provide a complete site grading plan, and drainage, erosion, and sediment control plan with applications to applicable lead agencies.
- For solar facilities, conduct soil surveys to identify soil types and the typical silt content of soils in many locations, to estimate soil erosion hazard.
- For solar facilities, project developers should conduct a preliminary hydrologic study of the project area in order to identify surface watersheds and groundwater basins potentially directly affected and connected to the location of the project site. The study should include the relationship of the project site hydrologic basin to the other basins in the region; identification of all surface water bodies (including ephemeral washes/drainages, playas and floodplains); identification of all applicable groundwater aquifers; the connectivity of surface water and groundwater, and the regional climate (seasonal and long term).
- For solar facilities, project developers should plan to implement water conservation measures related to solar energy technology water needs in order to reduce project water requirements. Developers should minimize the consumptive use of fresh water for power plant cooling by, for example, using dry cooling, using recycled or impaired water, or selecting solar energy technologies that do not require cooling water.
- The capability of local surface water or groundwater supplies to provide adequate water for the operation of proposed solar facilities should be considered early in the project siting and design.

2.6.3 Construction and Operation BMPs for Soils, Vegetation and Hydrology

- Minimize project disturbance area as much as possible, including minimizing lay-down areas and borrow areas.
- Build wind and solar facilities and access routes away from steep slopes (greater than 20 degrees).

[100] Sources include BLM 2005a, BLM 2005b, , California Energy Commission 2007, NWCC 2007, BLM 2008, Molvar 2008, The Nature Conservancy 2008, ONDA 2009, Arizona Game and Fish Department 2010, BLM 2010a U.S Fish & Wildlife Service 2010a, WOC 2010.

- Do not build facilities on unstable slopes, alluvial fans or areas with high erosion potential. Identify local factors that can cause slope instability (groundwater conditions, precipitation, seismic activity, slope angles, and geologic structure).
- Ensure that all temporary use areas during construction are restored. Reclaim areas disturbed during construction by spreading excess excavated soil to match surrounding topography, and reclaim as soon as possible with native seedings/vegetation and locally sourced topsoil.
- If new access roads and ways are needed, avoid gravel roads if possible and instead rely on dirt tracks and jeep trails constructed by cross country travel.
- If a paved road is absolutely necessary use standard BLM road construction BMPs (such as outlined in BLM Manual 9113) for all road construction.
- Make sure that any access roads that are built avoid stream crossings, wetlands and drainages. Where access roads must cross a dry wash, the road gradient should be 0% to avoid diverting surface waters from the channel.
- Minimize natural vegetation removal and considering cutting or mowing vegetation rather than total removal whenever possible.
- Take actions to prevent spread of weeds. Thoroughly wash all surfaces and undercarriages of vehicles and equipment before moving to the project site to remove any noxious or non-native plant seeds. Use certified weed-free straw or hay bales for sediment barrier installations, and certified weed-free mulch if mulching is needed on the site.
- If a weed problem persists on the site during construction, limit herbicide use to non-persistent, immobile herbicides. All herbicides should be applied in accordance with guidance provided in the Final PEIS on vegetation treatments using herbicides (BLM 2007).
- Avoid using fresh ground or surface water for solar power plant cooling. Instead, employ air-cooled technology or recycled/impaired water. If groundwater must be used, a comprehensive analysis of the groundwater basin must be conducted and any potential impacts thoroughly evaluated.
- Develop and follow a dust abatement plan for the site. This should include the use of dust abatement techniques on unpaved, unvegetated surfaces to minimize airborne dust; 25 mph speed limits on, and to and from, the site; covered construction materials and stockpiled soils; and dust abatement techniques that are used before and during surface clearing, excavation, or blasting activities.
- For solar facilities, minimize the amount of area of impervious surfaces, and consider the use of permeable pavement for areas that must be paved.

2.6.4. Monitoring BMPs for Soils, Vegetation and Hydrology

- Develop and abide by a storm water management plan to ensure compliance with state and federal regulations and prevent off-site migration of contaminated storm water or increased soil erosion.
- Monitor for the spread of invasive plant species post construction, and take action to prevent further spread of invasive weeds away from the site.[101]
- Regularly monitor rights-of-way (ROWs), access roads, and other project areas for indications of erosion.

[101] The BLM (2010a) recommends that integrated pest management, including biological controls, should be used to prevent the spread of invasive species, per the "Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States", and the National Invasive Species Management Plan, 2009.

- For revegetation and reclamation sites, keep livestock out of reclaimed areas until vegetation cover resembles the Potential Natural Community described in the NRCS Range Site Type description or Ecological Site Description.
- For solar facilities using groundwater and surface water for cooling operations, they should develop and implement a Water Resources Monitoring and Mitigation Plan, which includes monitoring the effects of groundwater and surface water withdrawal for project uses. The use of water should not contribute to the significant long-term decline of groundwater levels or surface water flows and volumes.

2.6.5 JUSTIFICATION FOR SOIL, VEGETATION AND HYDROLOGY BMPS

In terms of siting issues, development in areas of actively migrating sand dunes has the potential to slow or alter wind patterns, resulting in the conversion of open dune habitats to dunes stabilized by vegetation. Keith et al. (2004) reported that large amounts of wind power can extract kinetic energy and alter turbulent transport in the atmospheric boundary layer, with the result of slower wind speeds and greater turbulence near the surface. Roy et al. (2004) modeled the effects of wind farms in the Great Plains region and found that wind farms can significantly slow down the wind at the turbine hub-height level, and that turbulence generated by rotors creates eddies downwind of turbine arrays. In order to ensure that a reduction in wind velocity does not result in the stabilization of actively migrating dunes and the loss of open dune habitats, wind power projects should not be sited in or immediately upwind of areas of actively migrating dunes.

A number of construction-associated activities may adversely impact vegetation at a renewable energy development site. These activities include the clearing and grading of vegetated areas, and the introduction of invasive vegetation into disturbed areas of the immediate project site, and possibly into surrounding areas (BLM 2005b, BLM 2010a). Additional impacts on vegetation communities could occur from soil compaction (which can have even worse impacts in very arid environments such as salt desert, BLM 2008), loss of topsoil, and removal of or reductions in the seed bank during site clearing activities. Fugitive dust during construction activities can also potentially impact the plant community by coating the leaves of plants and potentially reducing photosynthesis rates (Thompson et al. 1984, Hirano et al. 1995), and increasing water loss (Eveling and Bataille 1984). These sorts of impacts that result from basic land clearing exercises are more common for solar facilities (than for wind farms), where current, typical rates are about nine acres of land cleared per megawatt of solar power generated (BLM 2010a).

A solar parabolic trough installation or solar power tower site requires flat land, and grading is the industry norm. The site is typically cleared of all vegetation to allow access to the installed equipment and to prevent fires. Herbicides may be sprayed or vegetation mowed to maintain cleared zones under and around the solar fields. Because some native plant species in our western deserts and arid landscapes may take decades or even centuries to recolonize after disturbance, development of this type has long-term consequences that cannot be undone, even if all of the installed equipment is removed and restoration attempts are made (Randall et al. 2010). The disturbance to fragile soil biological crusts can destabilize soils (Belnap and Herrick 2006), leading to increased particulate air pollution as soils are displaced by strong desert winds. In total, the surface disturbance at a solar facility is similar in intensity to large-scale commercial facilities, with an additional downside: the great expanse of exposed, disturbed soils found onsite and on associated roads is susceptible to invasion by non-native invasive plants which are known to thrive in areas of surface disturbance, and can serve as a reservoir of invasive species, furthering their dispersal into nearby natural lands which could result in long-term impacts to the native plant community (BLM 2010a, Randall et al. 2010).

When either solar or wind developments create large areas of disturbance, soil and groundwater and surface water resources can be impacted. In particular, the large, cleared, impervious surface areas created can block or reroute surface flows (Arizona Game and Fish Department 2010). This in turn can lead to and exacerbate soil erosion, weathering of newly exposed soils leading to leaching and oxidation which release chemicals into groundwater, discharges of waste or sanitary water, presence of dissolved salts from untreated groundwater used to control dust, and herbicide or pesticide applications (AGFD 2010, BLM 2010a). Soil erosion at a site can be particularly problematic as it can remove soil, decrease its productivity and damage biological resources. Further, if uncontrolled runoff from construction sites causes short-term increases in turbidity in nearby watercourses, this can exacerbate flooding and also lead to increases in sedimentation and siltation which degrades water quality (AGFD 2010).

Most solar facilities need relatively small amounts of water for periodic cleaning of their mirrors, but some solar-thermal facilities also require large amounts of water for cooling. Depending on how much water is needed at a given solar generation site, there can be a locally large impact on water resources (Randall et al. 2010), with possible concomitant effects on local springs and seeps (Patten et al. 2008). While photovoltaic installations require no water to generate electricity, water is required to wash panels. Solar power companies have indicated that between two and 10 acre-feet of water per 100 megawatt (MW) per year might be needed for this purpose (TNC 2008). Parabolic trough and solar technologies heat a transfer fluid that is in turn used to heat water to create stream and turn the turbines to generate electricity. Water is also required for the steam circuit and washing mirrors. In addition, if a plant uses wet-cooling of the exhaust steam from its turbines, industry standards indicate that up to 600 acre-feet of water per 100 MW per year may be required.[102] Often, the proposed sources of water for many currently proposed solar facilities are unclear. The BLM's recent Draft Programmatic Environmental Impact Statement for solar development stated that in most areas where solar projects are proposed, groundwater would likely be withdrawn from local aquifers to meet the project's water needs (BLM 2010a). Other options include water purchased through a water district and pumped to the site (Randall et al. 2010), though this is not usually an economically viable activity out in remote locations in our western deserts where most large scale solar facilities are planned.

2.7. SPECIAL BMP SECTION ON ADDRESSING LAND USE PLANNING AND RENEWABLES

The following Best Management Practices ensure that the basic, guiding principles of planning are followed in a land use plan's consideration for renewable energy. These should be followed by the land management agency that is amending a land use plan to incorporate renewable energy development. These BMPs should thus be solid guidance for those commenting on a land use plan that is being amended in an area that will incorporate new renewable energy:

- Describe planning issues in a way such that a remedy can clearly be seen to address the issue.
- Design the land use plan around goals and measurable objectives that capture important ecological factors.
- Design monitoring to measure ecological factors.
- Based on habitat and wildlife population conditions, establish ecological objectives for the renewable energy site and surrounding watershed that lead to restoration where needed for maintenance of healthy habitat.

[102] For more information on how to reduce water consumption with CSP technologies, please refer to the U.S. Department of Energy report entitled, "Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation" http://www.nrel.gov/csp/publications.html.

- For areas within the project site that need restoration or wildlife recovery, develop in the land use plan (or amendment) the actions needed to achieve wildlife and/or habitat recovery.
- Threats or stressors that either have led to degraded conditions in the planning area or threaten habitat in the future should be identified and the means to address those stressors developed.
- The plan should present the required sequence of actions that are needed for the siting and construction of renewable energy facilities that lead to achieving ecological objectives for the planning area. Construction and operation approval for renewable energy needs to be contingent on reaching and maintaining these goals.
- The land use plan should describe the resources available to implement the plan and assesses whether they are adequate in order to achieve ecological objectives.
- Monitoring should begin well in advance of construction. Background information on ecological goals is required in order to have a starting place to assess the impacts of the renewable energy site. Ecological reference areas should be established for comparison and long term monitoring.
- The land use plan should present how adaptive management will be used to incorporate renewable energy in the planning area. Adaptive management based on ecological goals uses monitoring data to determine whether renewable energy facility construction and operation are meeting goals, and this triggers responses in management to ensure goals are met.

2.8 IMPORTANCE OF ADAPTIVE MANAGEMENT AND BMPS

One important component of responsible and environmentally sustainable planning for and operation of large scale renewable energy sites is adaptive management. While we do not specifically link the guidances and suggested BMPs in this document to specific recommendations for adaptive management, this should be a part of all renewable energy monitoring. For the purposes of these BMPs, adaptive management can be thought of as a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs (Nyberg 1998).

With ecological adaptive management, ecological goals are expressed in terms of measurable objectives that can be determined through monitoring. Monitoring, in turn, assesses indicators of wildlife viability and habitat function as well as human use. This monitoring is then linked to analysis that determines whether the occurring human use (in this case, renewable energy production) is consistent or not with the ecological goals for the site. This analysis in turn has thresholds that, when reached, call for management changes that will lead to meeting ecological objectives. Post construction monitoring efforts at wind and solar facilities should always be designed and carried out with an eye to adaptive management at the facility.

BLM Wind Programmatic Environmental Impact Statement Record of Decision has this to say about the use of adaptive management:

"The BLM's Wind Energy Development Program will incorporate adaptive management strategies to ensure that potential adverse impacts of wind energy development are avoided (if possible), minimized, or mitigated to acceptable levels. The programmatic policies and BMPs will be updated and revised as new data regarding the impacts of wind power projects become available. At the project-level, operators will be required to develop monitoring programs to evaluate the environmental conditions at the site through all phases of development, to establish

metrics against which monitoring observations can be measured, to identify potential mitigation measures, and to establish protocols for incorporating monitoring observations and additional mitigation measures into standard operating procedures and project-specific stipulations. The BLM has the right to reassess mitigation measures if monitoring shows they are not succeeding/achieved or if new science supports the use of different or additional mitigation measures."

All wind facilities should incorporate this type of adaptive management into their site operation plans. If post-construction surveys indicate unacceptable levels of avian or bat fatalities, actions to mitigate these impacts should be taken. For example, wind facilities can be shut down temporarily at night during peak migration periods to reduce collisions. Alternatively, individual turbines that appear to be particularly dangerous to birds and bats can be shut down temporarily. To avoid bat fatalities, wind turbines also may be programmed to begin operating at higher minimum wind speeds during bat migration periods. Research has shown that temporarily stopping wind turbines during low-wind conditions can dramatically reduce the number of bats killed at wind plants with a minimum loss of power output.

3.0 Research Needs

We have found very few studies that investigate the impacts of wind energy development on big game. There is some anecdotal information that pronghorn and even elk may continue to use the Foote Creek Rim wind power site in Wyoming, but this area has not been subjected to rigorous scientific study (Molvar 2008). As such, we would recommend that the first wind projects to be constructed within big game crucial ranges or migration corridors should be accompanied by rigorous scientific studies to determine the level of tolerance of big game for wind power facilities. These studies should describe the area of avoidance if displacement occurs; test the same hypothesis for operation activities as is tested for development; determine population levels effects, if any; and determine how long it takes for animals to resume using the wind power facility site. Such studies should use Before-After-Control formats for maximum scientific rigor. If these studies indicate that displacement of big game by wind power development from a type of sensitive range or migration corridor is negligible, then other wind power projects should be free to proceed in that type of range or migration corridor.

In terms of needed avian research, further research is needed to determine whether wind turbines adversely affect local sage-grouse populations. Also, it is unclear whether a high density of wind turbines increases or decreases raptor mortalities (Anderson et al. 2004, Smallwood and Thelander 2005). More study is needed to determine whether advantages can be gained by altering the density of turbine arrays.

Kunz et al, 2007b, Horn et al. (2008) and Cryan (2008) hypothesize that bats are attracted to turbines, which, if true, would further complicate estimation of exposure. Reasons for apparent attraction may include sounds produced by turbines, a concentration of insects near turbines, and bats attempting to find roost locations (NWCC 2010). Further research is required to determine if bats are attracted to turbines and if so, whether this increased individual risk translates into higher population-level impacts for bats. Also on the bat research front, there is a need to better relate bat fatalities among wind facilities to landscape characteristics (e.g., geology, topography, habitat types, proximity of facilities to features such as mountain ranges or riparian systems). Relating fatalities to features within the immediate area of a turbine (e.g., proximity to water or forest edge) will help with designing future facilities and locating

turbines to avoid higher risk areas within a site. (Kunz et al. 2007b; Kuvlesky et al. 2007; NAS 2007; Arnett et al. 2008). In their literature review on patterns of bat facilities at wind energy facilities in North America, Arnett et al. (2008) also noted that more research is needed to elucidating patterns of fatality associated with weather conditions (e.g., wind speed, barometric pressure) and technical parameters (e.g., turbine size and ht, linear array of turbines vs. scattered individual turbine locations) of different facilities.

Arnett et al. (2008) also go on to say that since a large proportion of bat fatalities occur during fall migration, particularly on nights with low winds and relatively low levels of power production, curtailment of operations during predictable nights or periods of high bat kills could reduce fatalities considerably, potentially with modest reduction in power production (referencing Kunz et al. 2007). Thus, Arnet at al. propose that manipulative experiments be implemented at wind facilities across different regions to test various curtailment treatments with regard to the effect on reducing bat fatalities and economic costs of those treatments.

4.0 Conclusion

This peer-reviewed document has presented a set of BMPs, which, if followed, should help ensure that potentially adverse impacts to most species of concern and their habitats present at renewable energy project sites would be reduced. However, we stress that, like all other science-informed management directions, the use and implementation of these BMPs must include adaptive management.

These BMP's and guidance document will evolve over time as additional experience, monitoring and research becomes available on how to best minimize wildlife and habitat impacts from wind and solar energy projects. As such, we plan to continue work with industry, developers, the conservation community and other stakeholders and states to evaluate, revise and update these BMPs and guidance document on a periodic basis.

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California Desert & Renewable Energy Working Group
c/o Resources Legacy Fund
555 Capitol Mall, Suite 675
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December 22, 2010

The Honorable Ken Salazar
Secretary
United States Department of the Interior
1849 C Street, NW
Washington D.C. 20241

Dear Secretary Salazar:

Thank you for participating in our meeting in San Francisco this fall and for inviting us to submit the enclosed detailed recommendations on ways to improve planning and permitting for the next generation of solar energy projects on public lands in the California desert.

As you know, the California Desert & Renewable Energy Working Group (CDREWG)—a dialogue between representatives of the solar and wind energy industry, the electric utility sector, and the environmental community—seeks to protect ecosystems, landscapes, and species while supporting the timely development of renewable energy resources in the California desert.

The recommendations we offer herewith are based on our extensive experiences as renewable energy industry and environmental stakeholders in the fast track process, and are the result of hours of thoughtful discussion within our group about ways the planning and permitting process could be improved in 2011.

To facilitate coming to agreement on these recommendations, we focused our comments on ways to improve planning and permitting for large-scale solar energy projects on BLM lands here in California. That being said, we realize that many of these recommendations may also apply to other states and to other technologies, and encourage you and your team to think of them in a broader context.

As discussed with Steve Black and Janea Scott on October 13, and since, we would like an opportunity to discuss these recommendations with your senior team at their convenience, either in Washington or here in California. The recommendations represent a whole-hearted effort on our part to help you facilitate the permitting of well-planned and sited renewable energy projects in 2011—projects that will both help our nation reduce our greenhouse gas emissions and protect the unique ecosystems and places that define us as Americans.

Lucy Blake, the facilitator and coordinator of our group, will contact Steve Black and Janea Scott immediately to explore the best time and location for a follow-up meeting

with your senior team. We look forward to a very productive dialogue on these issues, as soon as it can be arranged.

Sincerely,

Lisa Belenky
Center for Biological Diversity

Darren Bouton
First Solar, Inc.

Barbara Boyle
Sierra Club

Laura Crane
The Nature Conservancy

Kim Delfino
Defenders of Wildlife

Shannon Eddy
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National Resources Defense Council

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Center for Energy Efficiency
& Renewable Technologies

Enclosure

cc: Tom Strickland
Steve Black
Janea Scott
Bob Abbey
Will Shafroth
Jim Abbott

Recommendations to Secretary of the Interior Ken Salazar on Ways to Improve Planning and Permitting for the Next Generation of Solar Energy Projects on BLM Land in the California Desert

California Desert & Renewable Energy Working Group
December 22, 2010

Signatories

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Laura Crane, *The Nature Conservancy*
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Table of Contents

I. Reduce Speculation in Solar ROW Applications[1]

Issue: The Bureau has made significant progress in reducing speculative applications for solar development in California. As a result of the Bureau's enforcement of its Plan of Development ("POD") policies in California, the total quantity of applications and acreage has declined substantially. The Bureau's adoption of enhanced guidance, such as the October 7, 2010, Instruction Memorandum (the "Oct. 2010 IM"),[2] promises further improvement. However, speculative applications remain, both in terms of applications that may not be technically and economically feasible, and in terms of the size of applications relative to the reasonably likely size of facilities (even accounting for additional acreage reserved to allow for reconfiguration, which we support).

Solution: To ensure that the most suitable lands for solar development are used appropriately, and that real solar development is not displaced from those lands onto other lands that may be less suitable, the Right-of-Way ("ROW") application process requires further reform. It will be particularly important to avoid unduly oversize ROW applications, relative to actual project size, in Solar Energy Study Areas/Zones, as these are intended to be the place for focused, large-scale, solar development. If areas in those zones are taken up with speculative applications, the purpose of the Solar Energy Study Areas/Zones will be frustrated, and real solar development will be diverted elsewhere.

To that end, the California BLM office should resume its enforcement of the existing POD policy, and other state BLM offices should follow California's example. In addition, the Bureau should build on the concepts in its Oct. 2010 IM, and on its existing regulations, to provide for earlier screening to eliminate speculative applications. This process should focus on objectively-determined assessments of site development progress.

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[1] Although these recommendations are intended for implementation in California, the Bureau may wish to consider how they may apply to other states

[2] IM 2010-003 (Oct, 2010) , available at http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2011/IM_2011-003.html

2011 Q1 Progress Assessments

The Bureau can act to focus its resources on the most viable 2011 projects, and reduce speculation, through assessments of the projects' progress in achieving the milestones discussed below. These milestones address aspects of financial and technical viability but do not address other aspects of project viability, including the appropriateness of the site for solar energy development, as discussed in Section II of these recommendations.

A. Enforcing Plan of Development Standards

As noted above, the California state office has made substantial progress in reducing speculative applications by requiring Plans of Development that meet the Bureau's standards. Resuming enforcement of this requirement will undoubtedly continue to provide good results. As part of this effort, the Bureau should ensure that the size of the applications is reasonably related to the size of the project described in the Plan of Development, with flexibility to allow for reconfiguration to avoid or minimize environmental, cultural or other impacts.

B. Applying Financial Viability Screens

The Oct. 2010 IM provides for assessment of financial viability, providing a presumption of viability for entities that have successfully owned, developed, or managed similarly-sized electric generation projects, and allowing individual demonstrations for others, which may be evaluated jointly with the Department of Energy. Projects proposed for potential approval in 2011 should be evaluated in the first quarter of 2011. To ease administrative burdens, avoid duplicative governmental efforts, and make use of reasonable market-based indicators of financial viability that can be objectively ascertained, the Bureau should expand its presumptions of financial viability to include projects that have (i) a conditional commitment for a DOE loan guarantee; (ii) a power purchase agreement that has been approved by the California Public Utilities Commission or municipal power authority; or (iii) an engineering, procurement and construction ("EPC") contract with an entity that has successfully constructed electric generation projects of similar capacity within the last five years. As provided in the Oct. 2010 IM, projects that do not meet these presumptive tests should be allowed to make individual demonstrations of financial viability to the Bureau.

C. Applying Technical Viability Screens

Technical viability should be presumed, similar to financial viability, if (i) the DOE has provided a conditional commitment for a loan guarantee; (ii) the basic technology to be deployed has been demonstrated for at least one year in a commercial or demonstration plant; or (iii) the key components of the technology have been demonstrated, and the applicant has supply contracts with credible third-party vendors for the manufacture and/or supply of those demonstrated, key components. These technical viability tests would not apply to demonstration projects.

D. Evaluating Site Development Progress

To ensure sites are being actively evaluated for approval and development, and not held speculatively, developers should demonstrate that they are undertaking the necessary assessments. For 2011 projects, site-specific technical assessments, including meteorological and geotechnical data collection and evaluation, as well as biological surveys, should either already have been completed or should be planned. All applicants should be required to provide a schedule for conducting remaining technical assessments needed to complete timely NEPA analyses, consistent with completing the permitting process in 2011. Applicants should be required to demonstrate diligent progress on the schedule through regular reports.

E. Assessing Permitting & Transmission Viability

All solar development projects require state and/or local government permitting for construction and operation, as well as approval to interconnect their facility with transmission. As with technical assessments, solar development applicants should provide the Bureau with a schedule for applying for all necessary permits, as well as for interconnection with transmission. The timetable should demonstrate that the necessary permits will be obtained to allow timely construction commencement and completion, consistent with the deadlines provided in the Oct. 2010 IM. The Bureau may wish to consult with the California ISO or other appropriate permitting or transmission oversight entities to determine whether proposed schedules are reasonable. Applicants should be required to demonstrate diligent progress on the schedule through regular reports.

II. Apply Screening Criteria for California Desert Solar Projects on BLM Land

Issue: BLM has limited resources to apply to the review of proposed renewable energy projects in the California Desert in 2011. The agency should focus first on those projects with the greatest technical and financial viability and the fewest environmental conflicts.

Solution: BLM should adopt criteria to help ensure that it moves forward expeditiously to prioritize those projects that have the highest likelihood of permit approval by the end of 2011 – i.e., likely to be permitted and built with a minimum of time and controversy. Priority projects include those in low conflict areas and those with potentially resolvable conflicts where attention is paid to resolving the conflicts.

Ground rules: The criteria set out below are designed only for allocation of BLM resources in 2011 for solar projects on BLM land in the California desert.[3] Moreover, they are not comprehensive criteria for BLM: there are other important criteria such as cultural and historic criteria that are not addressed here, because our group does not include representatives of those interests

[3] To be clear, we did not develop these criteria for use outside of the California desert, by other agencies, other than in 2011, or for technologies other than solar.

The criteria should be applied on the basis of currently available data by multi-disciplinary teams that include biologists and botanists familiar with the California Desert. In addition, they should be applied to projects concurrently with the technical and financial viability screens that are also part of our suggested guidance. Projects should be placed in one of the three proposed categories if they meet some or all of the criteria provided for that category. The number of criteria for a given category that a project meets will be highly relevant. For example, in the case of the criteria designed to help identify "low conflict areas," the more of those criteria that a project appears to meet, the better.

Projects identified by DOI as potentially able to meet 2010 ARRA deadlines, and listed in Appendix A would be exempt from these screening criteria.[4]

Recommended Guidance for use in prioritizing 2011 projects:

Low Conflict Areas: timely or expedited permitting/probable permit approval
As indicated above, projects should be placed in this category if they fit some or all of the following criteria. In addition, they should be included here if it appears that they can be revised or modified relatively easily in order to address conflicts identified in the categories below. That being the case, it is entirely possible that once additional data are obtained from site-level surveys, BLM may find that sites that initially appear to meet these criteria may nonetheless present conflicts.

- Mechanically disturbed lands such as fallowed agricultural lands.[5]
- Brownfields, idle or underutilized industrial areas.
- Locations adjacent to urbanized areas[6] and/or load centers where edge effects[7] can be minimized.
- Locations that minimize the need to build new roads and that meet the one or more of the following transmission sub-criteria: transmission with existing capacity and substations is already available; minimal additional infrastructure

[4] However, even for those projects, these screening criteria may provide useful information regarding potential high conflict sites and, accordingly, the BLM should ensure that developers are aware of these criteria.

[5] This criterion covers lands that have been "type-converted" from native vegetation through plowing, bulldozing or other mechanical impact often in support of agriculture or other land cover change activities (mining, clearance for development, heavy off-road vehicle use). Some of these lands may be currently abandoned from those prior activities, allowing some natural vegetation to be sparsely re-established. However, because the desert is slow to heal, these lands do not support the high level of ecological functioning that undisturbed natural lands do.

[6] Urbanized areas include desert communities that welcome local industrial development but do not include communities that are dependent on tourism for the economic survival.

[7] The edge effect in ecology is the effect of the juxtaposition or placing side by side of contrasting environments on an ecosystem. This term is commonly used in conjunction with the boundary between natural habitats and disturbed or developed land. Edge effects are especially pronounced in small habitat fragments where they may extend throughout the patch. See Harris, Larry D., *"Edge Effects and Conservation of Biotic Diversity,"* Conservation Biology, Vol. 2, No. 4 (December 1988).

would be necessary, such as incremental transmission re-conductoring or upgrades, and development of substations; if a new line is needed, the line has already been permitted and is not the subject of pending litigation.

- Proposed Solar Zones that will be published in the BLM's draft Solar PEIS with the exception of the proposed Iron Mountain and Pisgah zones[8]
- Areas in the West Mojave that have been run through the criteria above and previously identified for BLM by environmental groups as potentially appropriate for development.[9]

Areas with Potentially Resolvable Conflicts: more difficult permitting process unless conflicts are resolved

- Wetlands, riparian areas, and areas required to protect the integrity of seeps, springs, washes, streams or wetlands that have been previously identified by the BLM, the Army Corps of Engineers, or other relevant state or federal agencies.[10]
- Lands that have been formally identified as including plant communities that are both unique and rare by the BLM, California Department of Fish and Game (CDFG) or USFWS, including areas containing or designated Unique Plant Assemblages (UPAs), Stands, or Vegetation Alliances that are limited in distribution or that support sensitive or endemic species.[11]
- Dunes and the sand transport systems and corridors that support them.[12]
- Locations within one mile of National or State Park units.
- Landscape-level biological linkage areas that have been identified in reports listed in Appendix C as key connectivity references for the desert; or by state or federal agencies as necessary and required for the continued functioning of biological and ecological processes (e.g., connectivity); and that have been mapped by, contracted for, or used in state or federal agency maps provided in land management plans and proposed plans. For these areas closer scrutiny of the broad-scale maps and reports will be necessary.

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[8] This is not a consensus position of the CDREWG. However, the environmental organizations that are members of the group are on record stating that both the Iron Mountain and Pisgah Solar Energy Study Areas are inappropriate for development and should be deleted.

[9] A map of these areas is attached and explanatory material is included in Appendix B.

[10] These areas may include the upland habitat as well as groundwater resources that are proposed to be used. The extent of upland habitat that needs to be protected is sensitive to site-specific resources. For example: the NECO Amendment to the CDCA Plan protects streams within a 5-mile radius of Townsend big-eared bat maternity roosts. Aquatic and riparian species may be highly sensitive to changes in groundwater levels.

[11] These areas are identified in the California Desert Conservation Area Plan of 1980, in the California Department of Fish and Game's List of California vegetation alliances (2009), and in NatureServe's Community Heritage Program, which is internationally recognized as the Natural Communities Conservation Ranking system.

[12] The USGS document Muhs et al 2003 "Eolian sand transport pathways in the southwestern United States: importance of the Colorado River and local sources" will be helpful in identifying these areas.

High Conflict Areas: very difficult permitting process

Members of this group agree that the following areas are high conflict areas:

- Designated critical habitat for federally threatened and/or endangered species.
- Designated special management areas such as Areas of Critical Environmental Concern (ACECs), Desert Wildlife Management Areas and Wildlife Habitat Management Areas.[13]
- Lands that have been formally proposed by federal agencies for designation as wilderness, or proposed for a national monument or wilderness designation in S.2921 (111th Congress).
- Lands that were originally part of a renewable energy right of way application and were eliminated from a ROW application by BLM or the applicant due to resource conflicts.[14] For example, where the final project represents a smaller or different footprint to avoid wildlife habitat, rare vegetation or desert washes, the excluded portion of the right of way should no longer be available for development.[15]
- Lands that have conservation value and were purchased with federal, state or private funds, and donated or transferred to the BLM for conservation purposes.
- Lands purchased with federal, state or private funds, and donated or transferred to the BLM expressly as mitigation for project impacts.

The group also agrees that projects that propose to use wet cooling will likely face additional controversy in the permitting process.

The environmental groups signatory to this document believe that there are other factors that will be controversial within their community, as noted below.[16]

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[13] ACECs include Desert Tortoise Desert Wildlife Management Areas (DWMAs). The California Desert Conservation Area Plan has designated specific Wildlife Habitat Management Areas (WHMAs) to conserve habitat for species such as the Mojave ground squirrel and bighorn sheep and to preserve connectivity. Some of these designated areas are subject to development caps which apply to renewable energy projects (as well as other activities).

[14] This category also includes the projects in the West Mojave that were rejected by BLM solely because they were located in areas subject to a 1% development cap. This group continues to believe that the agency should develop guidance regarding how that cap will be applied to subject areas, but development in these areas will likely remain controversial.

[15] We urge the BLM to develop and maintain a publicly accessible database of lands that have been eliminated from ROW applications due to resource conflicts.

[16] These factors include the following:

- Lands that have been designated or are undergoing a formal review process by Bureau of Land Management (BLM) or the U.S. Fish and Wildlife Service (USFWS) for designation for protection of federally-listed, state-listed or candidate species in any past or present recovery plan as of November 19, 2010, in any past or present critical habitat proposal or in any areas formerly designated as critical habitat as of November 19, 2010, or in any past or present ACEC proposal by BLM as of November 19, 2010. In addition, lands that have been formally identified by CDFG, BLM, or USFWS as critical to the survival and/or recovery of federal or state listed or candidate species as of November 19,

III. Ensure early and ongoing input from stakeholders

Issue: The public had little input into the selection of the initial BLM "fast-track" projects in 2009, and few opportunities to provide input into alternative project configurations or ROW footprints. Lack of early public input can result in significant investments of time and money by companies with little opportunity to obtain clear signals on potential conflicts and controversies associated with their proposals prior to committing resources.

Solution: Provide guidance to the BLM to establish a process to facilitate early and ongoing input and coordination with interested stakeholders, per the Oct. 2010 IM, including project developers, regulators, conservation groups and other members of the public, while ensuring a workable process:

- Provide opportunity for early input in connection with initial agency review of projects. This could include, for example, sponsoring preliminary public workshops prior to official scoping.

- Provide, and encourage developers to participate in, forum(s) where the public can interact with them, regulators and other interested parties, including tribes, to ensure early (i.e., prior to NEPA) as well as ongoing input into:
  - project configuration and potential modifications to minimize environmental impacts,
  - disclosure and analysis of likely mitigation requirements, and
  - identification of appropriate alternatives.

  Any project modifications made prior to NEPA review that reduce potential project impacts should be recognized in the agency's NEPA document.

- Ensure stakeholders can provide early and ongoing input to inter -governmental entities that are established to coordinate renewable energy development (such as those established under MOUs with states, like the REPG and REAT in California), and that applicants are made aware of the substance of suggested project modifications in a timely fashion.

2010 should be included in this category. Lastly, lands identified as "ecologically core" and "ecologically intact" by The Nature Conservancy in its October 2010 Mojave Desert report.

- Lands that have been: inventoried by trained citizen groups, conservationists and/or agency personnel using BLM protocols; found to meet Congress' definition of "wilderness characteristics;" and publicly identified as of November 19, 2010. Maps of these lands in California (and other western states) as of November 19, 2010 can be found at http://www.nrdc.org/land/sitingrenewables/default.asp.

- Ensure that all forums for public involvement, including workshops and public meetings, are, to the maximum extent possible, designed to provide effective and meaningful opportunities for interested stakeholders to provide their views about proposed projects. Examples include but are not limited to: group question and answer sessions following presentations, ways to submit questions both during presentations and online, site visits with agency and company representatives, etc.

IV. Improve the quality and consistency of environmental reviews

Issue: The environmental reviews for the first set of fast track projects have varied widely in quality and thoroughness across BLM districts and states.

Solution: Through specific, clear guidance to BLM managers, ensure that moving forward, NEPA reviews are internally consistent, thorough, and reflect strong data-based analysis of the likely impacts from proposed projects. The overall NEPA review process should also be designed to identify, and facilitate, modifications that will result in improved projects. Not only will this inspire public and stakeholder confidence in the Bureau's management of the new program, it will likely insulate well-sited, designed and analyzed projects from legal challenge.

The Interior Secretary should direct the BLM to issue guidance to project managers, supervisors, and state directors that clearly spells out the following elements of strong NEPA reviews and recommended practices:

- Provide opportunities for early public involvement in the process, before investments are irrevocably committed to a specific design within a right of way (ROW), to diminish unacceptable impacts of renewable energy projects, identify potential improvements, and increase public support.

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- A consistent structure for environmental documents, to ease public review and help avoid missing elements.

- Purpose and need statements must include broader objectives, rather than solely responding to an application for a ROW; for example, the purpose and need statement should incorporate a phrase similar to the following: "To consider the proposed siting of a (large scale solar) project on public land consistent with national and state renewable energy and climate goals while protecting important natural values and environmental and cultural resources." This broader purpose and need objective would logically lead to a broader range of alternatives than project/no project.

- Analysis of a full range of alternatives is one of the most important aspects of NEPA. In the case of renewable energy projects, such a range may include, in addition to the proposed project and no action alternatives, alternative sites on public land as well as private land or "conjunctive use" involving both private and public land where appropriate, projects of reduced size and configuration, and

alternatives that include phasing the project based on successfully meeting specific benchmarks before proceeding from one phase to the next.

- A strong evaluation of impacts must be based on adequate site-specific data that stakeholders can fully evaluate, with specific requirements for data adequacy including appropriate protocol wildlife and plant surveys. Depending on the site and the likely species, this may require multiple surveys at different times of the year. Surveys of reasonable areas beyond the project footprint, should be conducted so that different configurations may be fully analyzed. Where surveys indicate changes in configuration would reduce impacts, BLM should expressly allow the applicant to expand or change the area(s) subject to the project application.

- A robust cumulative impacts analysis will ensure sufficient review of the project, focusing on quantitative assessments to the extent practicable, including all past, present and reasonably anticipated future projects within the relevant area, considering the resources at issue. In contrast, the direct and indirect impacts of connected actions (such as any additional transmission lines or substations that are required to serve a proposed project) should be fully evaluated as part of the proposed project, as well as reasonably anticipated additional projects within the relevant area, considering the resources at issue.

- The substance of important NEPA-related reports and plans (for example, a desert tortoise translocation plan, an avian protection plan, and mitigation plans) should be provided in time to allow for public review and comment in the Draft EIS. While we understand that it may be difficult to provide completed reports and plans at Draft EIS stage, any reports and plans that have been drafted or completed should be provided in the Final EIS and all final plans and reports should be issued at the time the ROD is released, along with the USFWS biological opinion.

- Project design changes that reduce environmental or other undesirable impacts are positive results of the NEPA process and such changes should not cause undue delays; however, major changes that have not been proposed or analyzed previously may require supplemental analysis.

- BLM should develop and apply consistent guidance to address issues that apply to several types of projects, and work with the U.S. FWS to develop such guidance in areas of their jurisdiction, such as desert tortoise translocation protocols. Such issues should be addressed in a standard manner across different projects, where practical, and where the standard approach is in the best interest of the impacted resources.

- Where project approval contemplates a plan amendment as well as issuance of a ROW, and information collected through the NEPA process suggests part of the ROW applied for is important for conservation and incompatible with

development, the plan amendment approved contemporaneously with the ROW should also designate the excluded areas within the original ROW application as unavailable for future such development.

- If a plan amendment is not contemplated as part of project approval, and areas within the ROW application have been identified as incompatible with development, BLM should initiate a separate plan amendment process to designate such areas as unavailable for future development.

V. Standardize and clarify mitigation procedures

Issue: While renewable energy at scale provides benefits for forestalling climate change impacts to species and habitat, large-scale solar projects also generally require large-scale mitigation. The current approach of project-by-project mitigation has resulted in a piece-meal and inefficient process for assessing and carrying-out mitigation, and fails to make the best use of mitigation resources to provide more comprehensive, coordinated benefits for affected species and their habitat.

Solution: Better defined, more uniform, and more coordinated approaches should be taken to address mitigation associated with these projects. The fast-track renewable projects have provided a number of important lessons in how to do mitigation, for the benefit of both the project proponents and the impacted natural resources. We believe that mitigation can be done with better coordination, greater efficiency, and strategic investment resulting in an improved conservation result on the ground, while retaining the beneficial aspects of large-scale solar projects.

We recommend that DOI adopt the following principles in directing its agencies on how to improve mitigation for renewable energy projects approved in 2011:

1. **Strategic & Effective Investment:** DOI and state agencies should develop a regional strategic mitigation process founded on habitat conservation planning principles that generates more robust and effective mitigation than can be achieved on a project-by-project basis. This effort can be informed by endangered species recovery plans and other long-term land and wildlife conservation plans. Strategic mitigation planning must address the following:
    a. Incorporation of biodiversity sustainability/viability indicators, including long term surface and groundwater supplies
    b. Designation of regions, based on biological integrity and ecosystem functions
    c. Designation of target mitigation acquisition lands and public land actions within each region that will maximize habitat, maintain and protect migration corridors, and maximize species survival and recovery.
    d. Allocation of pooled mitigation funds and activities for larger scale land acquisitions of designated property and mitigation measures.
    e. Long term stewardship and funding of stewardship of mitigation lands

f. Mechanisms to ensure mitigation investments are enduring and mitigation investment decisions are science-based

2. **Improved Coordination:** Mitigation measures should be formulated as a comprehensive package, in which all jurisdictional agencies coordinate their requirements and review, and in which other state, federal and local resource agencies with relevant expertise and information are consulted to the maximum extent possible. The comprehensive package for any individual project should, to the maximum extent possible, contribute along with measures taken for other projects to provide coordinated and increased benefits to impacted species, habitat and corridors. Federal and state agencies should also consult with local land agencies, land trusts, and other local experts.

3. **Consistency in Mitigation Approaches:** Project proponents and conservation NGOs believe that it is important to apply basic mitigation principles of how and when to assess mitigation in a uniform manner, so that all parties have a clear understanding of what is expected by the DOI agencies. The following are recommended mitigation principles to ensure consistency across projects:

   a. Mitigation Hierarchy: Mitigation must follow the hierarchy of avoid first, then minimize, then restore, then offset. The first step ("avoid") refers to measures taken (e.g., siting decisions) to preclude significant impacts from the outset, in order to completely eliminate such impacts on certain components of biodiversity or to meet specific conservation goals. The second step ("minimization") refers to changes (e.g., to project design or operations) that reduce site-specific impacts.

   b. Specific Mitigation Requirements: Mitigation measures for individual projects should be clearly justified, specific to the impact, and enduring. They should also be formulated to clearly link the impact to be mitigated to one or more specific mitigation measures. For example, tortoise fencing requirements should first explain how the tortoise fencing contributes to compensating for unavoidable harm, and should prescribe how many miles must be fenced, where the fencing is to be placed, and who will maintain it. Finally, specific alternative mitigation measures of equivalent mitigation value should be identified, in the event a specified mitigation measure proves to be infeasible or impracticable.

   c. Mitigate Appropriate Level and Scale of Impacts: Mitigation must be required for significant impacts resulting from the renewable project, whether direct, indirect or cumulative, including significant impacts resulting from the scale of the project. Mitigation of cumulative impacts should be developed for areas and resources impacted by multiple renewable energy projects and should address impacts to habitat quality (e.g., connectivity), ground and surface water resources, and air quality.

d. Address Climate Change Impacts: In determining appropriate mitigation, DOI agencies should consider changes in habitat, corridors, and species needs as the climate changes.

4. **Compensatory Mitigation Principles:** Compensatory mitigation for individual projects should include:
    a. As a first preference, acquisition, restoration and long-term management of private lands, providing replacement habitat of at least equivalent size and function ("compensation lands"), provided that:
        i. Compensation lands are managed as conservation lands. If compensation lands are to be transferred to agencies, they should be legally protected and held solely for conservation purposes. For example, any compensation lands transferred to BLM should be permanently segregated or withdrawn from all non-conservation use under the mining, grazing and other land use laws, using legally effective means (e.g., deed restrictions with enforcement rights held by third parties).
        ii. Mitigation value of compensation lands may be increased by enhancements and/or restoration to improve habitat value, in the same fashion as provided below with respect to public lands;

    b. As a second preference, enhanced conservation management and/or restoration of specified public lands that would not have otherwise been conducted by the agency using public funds. For example, lands should be permanently segregated or withdrawn from all non-conservation use under the mining, grazing and other land use laws, and BLM should consider mitigation mechanisms identified in the CDCA Plan as amended, including construction and maintenance of fencing near roads, buy-outs and retirement of grazing allotment permits, route closure, and re-vegetation of closed routes, etc.

    c. Compensation lands, whether owned or managed by public or private entities, must be accompanied by assurance of adequate long-term conservation management. For example, this assurance could be addressed through a committed, non-wasting fund adequate to provide long-term conservation management to enhance and maintain the required resource values, or other enduring measures.

VI. Standardize requirements for scientific monitoring

Issue: BLM's "use authorization" process does not currently have in place a standardized set of requirements for scientific monitoring. Thus, when BLM issues use authorizations, the requirements for scientific monitoring are inconsistent across BLM offices and personnel. This inconsistency wastes time and money, and interferes with the collection of information that could be used by the agencies, project developers and other

stakeholders to improve planning, review, management, and decision-making for renewable energy and other desert resources.

Solution: Building on the Instruction Memorandum guidance issued on October 7, 2010, BLM should identify a comprehensive set of monitoring requirements to be used in all future use authorizations. Clear and consistent criteria will have multiple benefits, including increased cost-effectiveness for BLM, taxpayers, and project developers, and the creation of a "level playing field" for solar project developers and the utility customers who buy the solar electricity. In addition, the adoption of clear, consistent monitoring criteria will help to improve scientific understanding of desert resources, including desert wildlife species, their habitats and their needs, and the effects of large scale projects, information which can be used to improve environmental reviews, design better mitigation plans, and support the development of projects with fewer impacts. Such information can also be used to inform larger scale analyses of eco-regions, species and other key indicators, and be shared with other agencies working to improve resource management.

BLM's guidance should establish clear and consistent criteria for gathering the biological and other resource data needed to establish the appropriate "baseline", and to monitor these resources over the life of the "use authorization" at both individual project sites and across multiple project sites. Such standardized criteria shall specify:

- The type of scientific data needed, including the identification of control sites;
- Responsibility for each kind of data collection and monitoring;
- The timing and frequency of data collection and monitoring;
- Protocols for collecting and modeling the data;
- Protocols for managing the data collected;
- Protocols for analyzing the data collected;
- Limits of acceptable change in resource conditions, and actions to be taken if those limits are exceeded;
- "Fallback" measures to be put into effect in the event that specified monitoring activities are not carried out;
- The need to make all monitoring data available for public review and evaluation; and
- The need to finalize a detailed monitoring plan, and commitment to fund the plan, prior to initiating project construction.

VII. Improve coordination within and between agencies and departments

Issue: Experience with the "fast-track" projects has shown that coordination within and between federal agencies, as well as with appropriate state agencies, is critical to a timely and efficient permitting process. The approach to federal-state coordination taken in California (where there is a separate state permitting process for solar thermal projects through the California Energy Commission) ultimately worked well. This approach may also be helpful in other states. However, coordination between federal agencies is in serious need of improvement.

Solution: In specific and clear guidance, adopt an improved process for coordination within and between federal agencies as outlined below. Such guidance should also capture the essence of the approach to federal-state coordination taken in California. In this way, the Department can ensure that key federal agencies work together efficiently and effectively, and that the benefits of the California approach can be exported to other states. We provide these recommendations to help facilitate a robust and timely permitting process for appropriately sited projects.

Guidance should be issued that directs the following:

1. At the national level:

- Establish a coordinating council within DOI that includes representatives of the Secretary's office, Assistant Secretary of the Interior for Lands and Minerals, BLM, FWS, NPS, the Solicitor's office and other relevant agencies (BIA) to review status of project reviews and related policy development, including the solar PEIS, and identify barriers to realization of the Administration's and the Secretary's goals. Council to meet at least monthly (preferably every 2 weeks).

- Convene an inter-agency group composed of relevant agencies outside of DOI – i.e., DOD, EPA, ACOE, FAA, Forest Service, and DOE – on a regular basis to discuss cross-cutting issues relating to planning and permitting.

- Designate a single lead official whose full-time job is to coordinate and facilitate project reviews over the next 18 months and to oversee the building of the framework for a more efficient, effective and coordinated "long-term" policy.

2. Establish a similar structure at the state level, led by each BLM state office, to identify issues, barriers and problems for resolution. These groups should meet every two weeks and should report on these issues etc. to the federal coordinator on a regular basis. Identify key contacts within all federal agencies from the top offices to the district level.

3. Encourage state governments to enter into MOUs with DOI that will create parallel structures in each state to interact with the federal representatives. The groups established in California, i.e., the REPG and REAT, have been instrumental in ensuring improved communication and coordination. Ensure all key contacts are identified as in #2 above and seek to identify effective ways to include counties as appropriate.

4. Establish a process, goals and timeline for project reviews during the "transition period" between the fast track projects and the Solar PEIS (i.e., next 18 months) and for completion of the long-term policy.

5. Require state teams and the federal government to establish goals and a workplan to achieve those goals that identifies resource needs and deficiencies.

6. Work through the above DOI processes to complete the solar PEIS and to review existing policies re: wind and geothermal development.

7. Use the above DOI processes to evaluate whether a dispute resolution-like process could assist in resolving conflicts earlier between agencies, developers and the public.

8. At the same time, encourage CEQ to provide a forum for interdepartmental coordination and cooperation between agencies (including FERC, Treasury and Energy) and tribal governments to discuss policy and other issues essential to achieve Administration's clean energy strategy/goals.

Appendix A
List of Solar Fast Track Projects on Public Lands in CA as of October 16, 2009

CA Tessera, Imperial Valley
Bright Source, Ivanpah
First Solar, Desert Sunlight
Solar Millennium, Palen
Solar Millennium, Blythe
Solar Millennium, Ridgecrest
Tessera, Calico
Nextera Genesis, Ford Dry Lake
Chevron, Lucerne Valley

Appendix B
Additional Solar Energy Development Study Areas in the Western Mojave
Explanatory Narrative (8/18/2010)

Background: Several prominent national environmental organizations[17] are actively participating in identifying issues and seeking appropriate opportunities for renewable energy development in the California Desert by developing recommended siting criteria that would potentially allow for development of projects in the an environmentally sustainable manner.

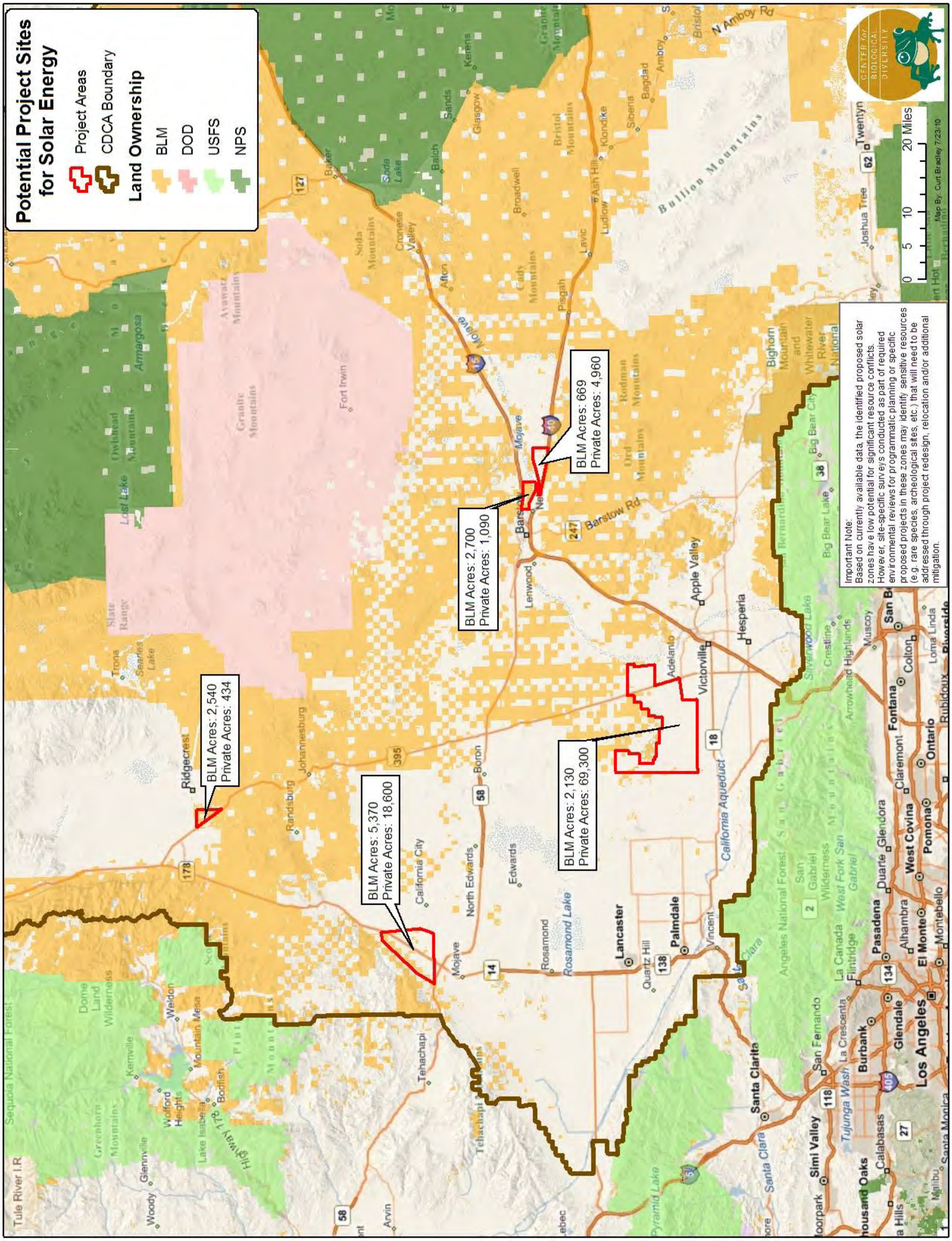
In April 2009 these organizations identified draft recommended solar energy development study areas consistent with their recommended siting criteria. These 2009 draft study areas were comprised of 53,400 acres of public land administered by the Bureau of Land Management and 242,200 acres of adjacent private lands. Subsequently these organizations sought to identify additional Western Mojave areas.

In recognition of the interest in the western Mojave region of California for solar energy development by industry, and the need to direct any such development to locations that are consistent with the siting criteria of the environmental organizations, additional potential solar study areas have been identified, as shown in the following table and on the attached map which consolidates the original study areas from 2009 with newly identified ones in the western Mojave desert.

Area Name	Acres		Total Acres	MW Potential[18]	
	Public (BLM)	Private		Public	Private
Ridgecrest	2,540	434	2,974	318	54
Mojave	5,370	18,600	23,970	671	2,325
Yermo	2,700	1,090	3,790	338	136
Newberry	669	4,960	5,629	84	6,200
Adelanto	2,130	69,300	71,430	266	8,662
Total	13,409	94,384	107,793	1,677	17,377

These potential study areas were selected based on a cursory analysis of slope, proximity to existing development and transmission infrastructure, and the same criteria used to select the original study areas in 2009. These additional locations are likely to have fewer biological values for conservation than other areas of the western Mojave desert due to existing disturbance, fragmentation of habitat and proximity to existing development. All of these areas include substantial private lands, because private lands tend to have sustained more disturbance and fragmentation as well as often being close to existing energy infrastructure

[17] Center for Biological Diversity, Defenders of Wildlife, Natural Resources Defense Council, Sierra Club, The Wilderness Society, Western Watersheds Project
[18] Assuming average of 8 acres/MW


Potential Project Sites for Solar Energy
Project Areas
CDCA Boundary
Land Ownership
BLM
DOD
USFS
NPS
BLM Acres: 2,540
Private Acres: 434
BLM Acres: 5,370
Private Acres: 18,600
BLM Acres: 2,130
Private Acres: 69,300
BLM Acres: 2,700
Private Acres: 1,090
BLM Acres: 669
Private Acres: 4,960
Important Note:
Based on currently available data, the identified proposed solar zones have low potential for significant resource conflicts. However, site-specific surveys conducted as part of required environmental reviews for programmatic planning or specific proposed projects in these zones may identify sensitive resources (e.g. rare species, archeological sites, etc.) that will need to be addressed through project redesign, relocation and/or additional mitigation.
0 5 10 20 Miles
Map By: Curt Bradley 7/23/10
CENTER for BIOLOGICAL DIVERSITY

Appendix C
Reference list for landscape-level biological linkage areas

Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat Connectivity Project: A strategy for conserving a connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration. February. (Spencer et al. 2010)

Beier, P., K. Penrod, C. Luke, W. Spencer, and C. Cabanero. 2006. South Coast Missing Linkages: restoring connectivity to wildlands in the largest metropolitan area in the United States. Pages 555-586 in: K. Crooks and M. Sanjayan (eds.). Connectivity Conservation. Cambridge University Press. (Beier et al. 2006)

Penrod, K., C.R. Cabanero, P. Beier, C. Luke, W. Spencer, E. Rubin, and C. Paulman. 2008. A linkage design for the Joshua Tree-Twentynine Palms connection. South Coast Wildlands, Fair Oaks, CA. www.scwildlands.org. (South Coast Wildlands 2008)
(http://www.scwildlands.org/reports/JT_TP_Connection.pdf)

Epps, C.W., J.D. Wehausen, V.C. Bleich, S.G. Torres, and J.S. Brashares. 2007. Optimizing dispersal and corridor models using landscape genetics. Journal of Applied Ecology 44:714-724. (Epps et al. 2007)