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We would like to submit the following comments on the Ivanpah Solar Electric Generating System- FSA and Draft Environmental Impacts Statement and Draft California Desert Conservation Area Plan Amendment.

Basin and Range Watch is a group of volunteers who live in the deserts of Nevada and California, working to stop the destruction of our desert homeland. Industrial renewable energy companies are seeking to develop millions of acres of unspoiled habitat in our region. Our goal is to identify the problems of energy sprawl and find solutions that will preserve our natural ecosystems and open spaces.

The agencies admit that impacts will be significant and unmitigable. The land use plan affecting this project is the BLM's California Desert Conservation Area (CDCA) Plan of 1980, which will have to be amended to include this project. "Impacts of the ISEGS project would also combine with the potential impacts of reasonably foreseeable renewable energy projects in the southern California Mojave desert to result in significant and unmitigable regional cumulative impacts related to land use" (page 6.5-1). Therefore we recommend the No Action alternative to avoid these impacts.

Project: The project will be built on approximately 4,073 acres. But he Final Staff Assessment/Draft Environmental Impact Statement states: "The applicant's proposed increase in heliostat mirror surface area associated with the Optimized Project Design led the applicant to also propose an increase in total ISEGS area

of about 300 acres and extension of the project boundaries of the three power plants by 250 feet along each perimeter...a portion of the increased heliostat surface area to be licensed ensures that the project will be able to meet its contractual output requirements even if the solar resource is less than forecasted. The final rows of heliostats may not be necessary. Pending the results of actual performance during plant operation, a decision will be made on whether or not to install the additional heliostats" (page 3-6). And more land: "In addition to use of the proposed right-of-way area, the applicant proposes some project-related activities to occur outside of the project fence, on land not included within the proposed right-of-way area. These would include inspection and maintenance of the fence, underground utility repairs, maintenance of drainage systems, and possible installation of new stormwater drainage systems. In addition to these activities, a roadway would need to be maintained outside of the project fence to allow vehicle and equipment access for these activities" (page 1-6). So after public comments are taken, after the environmental review process, and after the plant is built and begins operation, the applicant wants the option of more public land. The FSA/DEIS does not state whether this would trigger a new environmental review process, or whether this land is cryptically included in the present decision.

Heliostat mirrors would be washed every two weeks on a rotational basis. Washing would utilize water accessed from the groundwater supply wells, following treatment in a water treatment system. Washing would be done using a truck-mounted pressure washer, and use 42.7 acre-feet per year. But this basin has an undetermined amount of groundwater, and more wash-water may be needed, posing a risk to water resources in the area over time and taking into account the cumulative scenario of other developments proposed for Ivanpah Valley.

Without constant cleaning, the Daggett Solar 2 power tower heliostats degraded in quality as the mirrors became sand-blasted. This ended up reducing the efficiency of the system, and it produced less electricity than hoped (Romero-Alvarez, Manuel and Eduardo Zarza. 2007. Concentrating Solar Thermal Power. In, Frank Kreith and D. Yogi Goswami (eds.), Handbook of Energy Efficiency and Renewable Energy. CRC Press: Boca Raton, London, New York.). Developers wanting to build these delicate systems in the harsh desert may not be taking this into consideration.

On page 6.9-24 of the document, we learn more about the fragility of the mirrors: "An estimated mirror breakage rate of 0.1 mirrors per year likely much more (possibly in the thousands without mitigation and up to 50 with mitigation). The AFC [Application for Certification] states that broken mirrors would be replaced annually by one repair truck. However, the mirror repair activity would likely require several trucks. The AFC states that other repairs and security checks would be performed daily by one truck."

How will the applicant and BLM insure that these broken mirrors not harm wildlife or recreationists downstream as fragments might be washed by floodwaters through the site? Daily driving by trucks will further compact the soils on this delicate desert habitat, and destroy fragile cryptobiotic crusts. How will BLM insure that the site can be adequately restored after 50 years of industrial use?

The applicant claims it has a way of "lightly" impacting the desert, not grading the entire 4,000 acres of all plant life, in a "Low-Impact Development" design. What does this involve? The vegetation that could "interfere with mirror movement to a height of 12 – 18 inches" would be clipped and pulped (page 1-9 in the FSA/DEIS).

Creosote may stump-sprout after cutting, but could die after repeated cuttings. Many other shrubs present on the desert fan are adapted to dispersing by seed, and are killed by cutting at this level. We doubt that this treatment will result in "light" impacts to the Mojave Desert scrub habitat, but will severely alter it and destroy much of it. We are not sure what fire fuel management policy the company has in mind for all this potential dying vegetation.

Water-holding ponds or maintenance outwash basins for the power blocks are not well-described in the FSA/DEIS: "Two concrete-lined holding basins of about 40 feet by 60 feet are included in the power block area. They can serve for boiler commissioning and emergency outfalls from any of the processes" (From: CH2M Hill. 2008. Supplemental Data Response Set 2D. Revised Draft Biological Assessment, pdf at www.energy.ca.gov >>here). Are these still a part of the project design? Any standing open water may attract birds and other wildlife to the dangerous heated solar radiation between the heliostats and receivers. We recommend that any temporary water-holding ponds be covered with nets to exclude birds.

Within the heliostat fields, 10-foot wide maintenance roads would be established concentrically around the power blocks to provide access for heliostat washing and maintenance. The roads would be established between every other row of heliostats. The applicant estimates that 100 heliostats can be washed per hour with 4 trucks working 10 hours per night at about 0.4 mile per hour. 158,285 linear feet of new heliostat maintenance would be graded into creosote-bursage-cactus-yucca desert (page 6.2-61). An additional maintenance road would be established on the inside perimeter of the boundary fence. Within each unit, a diagonal dirt road would be established to provide access to the concentric maintenance paths and the power blocks. Some of these would be gravel. How will all these new roads be restored? Will the area become an off-roading area after the power plant is decommissioned?

What are the details of the grading? What are the acres of vegetation that would be left in place in the heliostat field, and how many acres will be graded? How level will grading be on this sloping fan? How many acres will be scraped of

vegetation and compacted by driving, but not graded?

How will the many water crossings be constructed over the washes? Will reinforced concrete or gabion baskets be used? How will the design prevent the scour and washout of major asphalt access roads during storm events? Will offsite stormwater drainage be collected using a system of swales, berms, and existing ephemeral washes to control and direct stormwater through and around the ISEGS site? If so, will this be outside of the ROW? How many acres will this take up? Will separate environmental review be done for this drainage system?

The project area would be surrounded by security fence, which would be constructed of □8-foot tall galvanized steel chain-link, with barbed wire at the top as required. Tortoise barrier fence would also be installed, consisting of 1-inch horizontal by 2-inch □vertical galvanized welded wire. The fence would be installed to a depth of 12 inches, and would extend 22 to 24 inches above the ground surface and integrated with the □security fence.□How will this allow□the management of public lands for multiple use?□Another question is how these fine-mesh tortoise fences will act as barriers to flood debris allowed to flow in washes through the project. Will tortoise fences act as dams, collecting gravel, cobbles, and branches, eventually changing the flows of these washes? Will floodwaters overbank their channels, causing damage to fences and other structures? The hydrology could become a mess here. Those of us who live in the desert know that the infrequent yet strong flash floods in the desert easily take ill-conceived down fences.

In decommissioning, concrete, piping, and other materials existing below three feet in depth would be left in place. We request the applicant remove these materials.

BLM admits that the project would not conform with San Bernardino County's General Plan Conservation and Open Space Elements. How will this be mitigated?

Deadline for this Project: Due to the outstanding unresolved issues that this project has instigated, we would like to request that the deadline for the FSA/DEIS be extended into April, 2010.

Fast Tracking Deadlines: We believe it is unwise for the BLM to be using “fast tracking” seemingly to expedite approval of this project. We feel that there are enough outstanding unresolved issues that make approval and construction of facilities by fall of 2010 a very unrealistic goal. We would like to request that this project be removed from the fast track list in order to provide us with more time to examine the issues. We think a more realistic goal for the EIS process should extend into the year 2012, so more comprehensive biological and cultural site surveys can be conducted.

Alternatives: We support the No Action Alternative, but we request at least one viable third alternative away from the site and out of Ivanpah Valley be provided in the EIS.

Purpose and Need: Although it is not the job of the BLM to list private land alternatives, there is little logic found in the purpose and need for the project as well as the best possible management options for public lands. Many renewable project developers have failed to consider reasonable or viable alternatives that could serve as solutions that everybody could live with. In the case of this particular project, cultural resources, storm water drainage erosion, endangered species, viewscapes from National Parks and wilderness areas could all be avoided with a distributed generation alternative.

There exist many high-risk problems and assumptions associated with the project design. No power tower has ever been built on this scale, and the location presents several unresolved problems for operation and maintenance.
Parts of the project are experimental and little tested. In Ivanpah 3 with five towers, saturated steam transferred in very long pipes is experimental. A 6 MW pilot project in Israel would be used to simulate ISEGS 100 MW and 200 MW plants, and this is very risky for the public to support, on public land and with taxpayer subsidies.

The applicant may have underestimated the amount of summer cloud cover over Ivanpah Valley, compared to central and western Mojave locations that are not as influenced by the Arizona Monsoon. Two years of weather measurements would not pick up the variation over decades in cloud cover patterns in the area, which would include many El Nino wet events; in addition, some summers over any ten-year period are well above-average for monsoonal activity in the east Mojave Desert. Problems have been encountered with the applicant's pilot project when clouds move over part of the heliostat field and become stationary, causing one side of the tower receiver to heat while the other side cools. This may cause damage to the receiver and necessitate placing the heliostats in the safety position. In addition, the superheater experiences problems when part of the heliostat field is covered with passing clouds, and must be put on standby mode. Twenty-five to 30% of rainfall occurs in the summer in the east Mojave Desert, where Ivanpah Valley is located, compared to 5 to 10% in the west Mojave. This could significantly reduce plant efficiency and negate any benefits to greenhouse gas reduction that ISEGS might provide. In addition, clouds cause a further decrease in any slight dispatchability ISEGS would have during the sunlit hours. Cloud cover makes the solar field power generation untrustworthy, compared to natural gas. These types of solar thermal power plants will not compete with conventional power plants. Electricity prices from ISEGS may prove to be higher than anticipated.

When clouds obscure the field, the natural gas boilers will have to be used, and this increases carbon emissions with little actual power generation for the amount

of land used. But the boilers cannot be stopped and re-started quickly for clouds passing over in a few minutes. The boilers will be used only at partial load, inefficiently. Using the boilers during cloud clover would generate lower pressure steam, thus generating less electricity. Much more benefit could be gained from simply using natural gas at maximum efficiency with fully modern combined cycle natural gas plants and hybrid power plants in load centers, combined with distributed generation.

The trend in the rest of the world is away from large stand-alone power plants, such as ISEGS, to add-ons or augmentation to existing generation. This project is not needed.

Reliability and Efficiency: The Ivanpah Solar Electric Generating System if constructed and operated as proposed, would generate 440 megawatts (MW) (maximum net output) of electricity, and would use natural gas to generate up to five percent of its capacity. We would like BLM to discuss capacity factor, the actual output of electricity that concentrated solar thermal power plants have produced to date. Without energy storage, the annual capacity factor of any solar technology is generally limited to about 25 percent of maximum according to the Renewable Energy Research Laboratory. ISEGS would not use storage technology.□□We disagree with the statement, "[ISEGS] would not create significant adverse effects on fossil fuel energy supplies or resources, would not require additional sources of energy supply, and would not consume fossil fuel energy in a wasteful or inefficient manner" (page 7.2-1). Fossil fuel would have to be burned elsewhere on the grid as baseload, mostly as coal, as solar energy is intermittent. The Ivanpah solar plant will not run during the night, during cloudy days, and on cold winter mornings the small on-site natural gas burners will have to run to heat the system up.□□

On page 7.2-2, the Final Staff Assessment/Draft Environmental Impact Statement (FSA/DEIS) states: "So far as staff can determine, methods for determining the efficiency of a solar power plant have yet to be standardized; research has uncovered no meaningful attempt to quantify efficiency. The solar power industry appears to have begun discussing the issue, but a consensus is forthcoming..."

But why is CEC/BLM comparing ISEGS to a baseload plant, which is supposed to produce energy at a constant rate? Examples of baseload plants include nuclear and coal-fired plants. Baseload plants typically run at all times of the year, and all night. Clouds do not turn them off. They also have dispatchability, able to ramp up or down to generate power on a human-based schedule. Peaks or spikes in customer power demand are handled by smaller and more responsive types of power plants called peaking power plants. Peaking plants are typically powered with natural gas turbines. Baseload power plants do not change production to match power consumption demands since it is more

economical to operate them at constant production levels. Natural gas is used in base load, intermediate cycle, and peaking units. In California, more than three-quarters of natural gas generation comes from combined cycle gas turbines (CCGT) operated as baseload and intermediate cycle units. Solar thermal power is not dispatchable.

A load-following power plant gradually ramps up and down its power output to respond to scheduled changes in power demand over the course of a day. Gas, pulverized coal, and hydroelectric generators are commonly used to follow the load. "Solar photovoltaic or CSP [concentrated solar thermal, like ISEGS] without storage can approximately follow the load on sunny days, when peak demand is around mid-day" (From Solar Southwest Initiative).

So the ISEGS solar thermal power plants should be compared to a load-following plant, not baseload. But not being dispatchable on command, it would compare poorly even with this. We have witnessed the summer monsoon season in Ivanpah Valley shade much of the area with tall thunderheads every afternoon for weeks.

The FSA/DEIS states: "Based on a review of the proposal, staff concludes that the Ivanpah Solar Electric Generating System (ISEGS) would be built and would operate in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability" (page 7.3-1). But even for standard solar thermal plant operation we question the placement of this project on an active floodwash fan in a desert with summer monsoon above the average for the western and central Mojave Desert (where other CSP projects such as Daggett Solar 1 and SEGS Kramer Junction plants, are located). Concentrating solar power needs a sharp sun image to be efficient. It is best done in deserts where there are no clouds or haze. Dust haze scatters light, and image efficiency plummets. Windstorms blow dust off Ivanpah playa frequently, and could lower efficiency for ISEGS. Cloud cover will force the plant to be turned off during winter and summer storms.

Will high winds whipping through the desert rip 20-foot wide heliostats off their bases like sails? But what surprises us most is the location of the proposal directly below a large rain catchment basin on the slopes of Clark Mountain. Did the engineers in the city understand desert alluvial deposition processes, or surficial geology and hydrology?

Researchers measured "normal" rain runoff on a fan below the Providence Mountains, just 60 km south of Ivanpah Valley in Mojave National Preserve, from 2003 to 2006. They found that several winter and summer rainstorms delivered more than 10 mm per day of rain, enough to initiate runoff, and some intense summer storms were greater than 60 mm per hour. These redistributed sand, gravel, and organic debris. High-intensity summer rainfall could last an hour, often exceeding the infiltration rates of the soil (Miller, David M., David R.

Bedford, Debra L. Hughson, Eric V. McDonald, Sarah E. Robinson, and Kevin M. Schmidt. 2009. Mapping Mojave Desert ecosystem properties with surficial geology. In, The Mojave Desert: Ecosystem Processes and Sustainability. Edited by Robert H. Webb, Lynn F. Fenstermaker, Jill S. Heaton, Debra L. Hughson, Eric V. McDonald, and David M. Miller. University of Nevada Press: Reno and Las Vegas.).□

This was just over three years. Over the 50-year proposed lifespan of the ISEGS larger storms will occur, possibly as damaging as the flood that hit Furnace Creek in Death Valley National Park, and Surprise Canyon in the Panamint Mountains, California, in recent years.

This is an active sloping alluvial fan, not a stable flatland, seemingly not appropriate for a delicate heliostat array. In describing the engineering of a collector field, Romero-Alvarez and Zarza (2007:21-53) state: "Because of the large area of land required, complex algorithms are used to optimize the annual energy produced by unit of land, and heliostats must be packed as close as possible so the receiver can be small and concentration high. However, the heliostats are individual tracking reflective Fresnel segments subject to complex performance factors, which must be optimized over the hours of daylight in the year, by minimizing the cosine effect, shadowing and blocking, and receiver [light] spillage."□□Tracking control mechanisms continuously move the heliostats so that they focus solar radiation on the tower receiver. "During cloud passages and transients the control system must defocus the field and react to prevent damage to the receiver and tower structure" (ibid: 21-52).□□What if sediments from alluvial runoff tilt several heliostats in the field? Will operators be able to find and correct all heliostat deviations? How long will the plant be shut off while inspections are done after each storm and repairs are made? How much of a tilt would cause tower damage as reflected sun beams are aimed in the wrong direction?□□

In an investment cost breakdown of building a central receiver solar thermal power plant the heliostat field is the single most expensive part of the project, 40% of total capital costs. The power block comes next, at 32% of total (ibid:21-53).□□Yet, "Staff believes there are no special concerns with power plant functional reliability due to flooding (page 7.3-6).

At over 4,000 acres this plant's nameplate capacity is only 400 megawatts (MW), with a capacity factor of 28% and 7-10% transmission loss that would equal 100 MW. Compare this low efficiency to Southern Co./Georgia Power Co.'s Plant Bowen coal-burning power plant which occupies 2,000 acres but puts out 3,160 megawatts maximum at 70-90% capacity. This does not take into account the terrible cost of mountain-top removal mining for coal in the Appalachians, but the question should be asked how solar thermal will replace coal? Desert-top removal is just as bad.

For remote solar plants like the Ivanpah project, built hundreds of miles from cities, the cost of upgrading and building new powerlines needs to be factored in.

Local jobs: Solar technology is specialized. Most energy developers make promises to local communities that there will be hiring of local people, yet many energy developers usually bring people in temporarily and little benefit is provided to the local economy. Furthermore, when developers use only federal land, local economies receive fewer tax benefits. This is why a private land alternative should be considered.

Socio-economics: Turning the area into an industrial area is not consistent with a local tourism based economy. Mojave National Preserve has outstanding benefits to local economies in surrounding communities because its outstanding scenery attracts millions of visitors each year. Those visitors come to view nature and sweeping views. The cumulative impacts of surrounding this irreplaceable treasure with renewable energy facilities has the potential to drive tourism dollars away. We would like to request that BLM provide a full analysis on the potential impacts that reorganizing publicly supported desert protection measures would have on local tourism economies. Furthermore, tourism has stood the test of time. The new renewable economy that the administration is forcing upon us has not been tested for long-term economic sustainability. Because so much federal money is needed up front to make this experimental green economy work, we are worried that its potential failure will destroy the already stable tourist economy of the region. How would the construction of so many renewable projects impact the tourism of Primm and Nipton? Many visitors to the Mojave National Preserve stay in the hotels in these communities.

Access and Recreation: What kind of “mitigation” would be provided to compensate for disruption of access? Coliseum Road, currently a dirt road used by recreationists, would be paved to a 30-foot wide, two lane road for a distance of 1.9 miles from the Primm Valley Golf Club to the facility entrance. The road would be re-routed around the southern end of Ivanpah 2 before re-joining the current road to the west of the proposed facility. But two other dirt roads used by recreational users would be blocked and re-located outside of the project boundary fence. How will this affect recreational use of the roads? Even on weekdays we have seen several vehicles using Coliseum Rd. and other side roads. What are the estimated numbers of recreationist use through the area? This is a main area for access to Clark Mountain. How will the project affect road use?

The DEIS states, "The impact on the quality of outdoor recreational experience would diminish the experience of campers, hikers, hunters, and other recreational users" (page 1-26). Yet BLM concludes that impacts will not be significant. With a large increase in industrial facilities, traffic, noise, dust, and glare, the recreational experience of many users in the valley and in the surrounding Stateline Wilderness, Mesquite Mountain Wilderness, and Mojave

National Preserve, will be greatly impacted. Wilderness values will drastically decrease with an industrial facility a mile from wilderness boundaries. Views from Clark Mountain will be changed from natural to developed. Wildlife will potentially leave the vicinity, impacting hunting and birdwatching. Campers may not use the fan anymore because of bright glare and reduced night-time dark skies. Hikers will have less land to explore.

"The proposed project would contribute incrementally to the long-term reduction of outdoor recreation quality available in the Ivanpah Valley area of the California Desert due to the cumulative effects of development leading to a transformation from a natural setting to a more industrial setting" (page 6-18.2). The No Action alternative should be considered to avoid these cumulative impacts to multiple use and recreation of public lands.

Carbon cycle and Greenhouse gases: Scientific studies have revealed that desert vegetation and biological soil crusts in the ecosystems, as well as soils, have the ability to store C02 gases (Have Desert Researchers Discovered a Hidden Loop in the Carbon Cycle? Richard Stone: Science 13 June 2008: Vol. 320. no. 5882, pp. 1409 - 1410 DOI: 10.1126/science.320.5882.1409).

How much C02 storage capability would be replaced by development? If the goal is indeed to reduce greenhouse gases, is it wise to remove this much carbon storing living crust? Please provide a detailed analysis on the amount of GHG that would otherwise be offset by an intact arid ecosystem.

Carbon balance is not discussed as a section in the FSA/DEIS, but we want to point out some discrepancies about utility-scale industrial renewable energy as an offset for the burning of carbon.□

CO2 will be emitted as trucks drive around hours a day, every day, washing mirrors and doing maintenance chores. We question how much greenhouse gases will be cut by the project when this is factored in. Not an idle issue, the same problem was brought up at a workshop for Tessera's Solar 1 Stirling engine solar project near Barstow, California: Tessera agreed to look into using alternative fuel or even electric trucks for washing at the 8,230-acre site to reduce carbon emissions (Transcript of September 16, 2009, Data Request and Issues Resolution Workshop in Barstow, Posted December 3, 200: 1.1 megabyte pdf >>here).□□

We would also like to know where each part is going to be made (will the mirrors be built in Europe?), and how much carbon will be released shipping these parts to the project site? □□

No Sulfur Hexafluoride (SH6) minimization is discussed regarding transmission line upgrades. SH6 is colorless and very powerful greenhouse gas used primarily in electrical transmission and distribution systems and as a dielectric in

electronics. The EPA calls SF6 a "High Global Warming Potential gas." From www.epa.gov: "Electrical Transmission and Distribution. The primary user of SF6 is the electric power industry. Because of its inertness and dielectric (non-conductive) properties, SF6 is the industry's preferred gas for electrical insulation, current interruption, and arc quenching in the transmission and distribution of electricity. SF6 is used extensively in circuit breakers, gas-insulated substations, and switchgear. The U.S. inventory report provides detailed descriptions on SF6 emissions from electrical transmission and distribution and how they are estimated (see the Chapter entitled “Industrial Processes"). EPA has also established a voluntary program, called the SF6 Emissions Reduction Partnership for Electric Power Systems, which works with the electric power industry to reduce SF6 emissions."

SF6 is 24,000 times as potent as CO2 in it’s global warming impacts. The Environmental Protection Agency has declared “that the electric power industry uses roughly 80% of all SF6 produced worldwide“. Ideally, none of this gas would be emitted into the atmosphere. In reality significant leaks occur from aging equipment, and gas losses occur during equipment maintenance and servicing. With a global warming potential 23,900 times greater than CO2 and an atmospheric life of 3,200, one pound of SF6 has the same global warming impact of 11 tons of CO2. In 2002, U.S. SF6 emissions from the electric power industry were estimated to be 14.9 Tg CO2 Eq. (http://www.epa.gov/electricpower-sf6/basic.html).

Please provide a detailed analysis of the amount of SF6 gases that would be released by this project.

Air Quality: Without adequate fugitive dust mitigation, the project would have the potential to exceed the General Conformity PM10 (particulate matter) applicability threshold during construction and operation, and could cause potential localized exceedances of the PM10 levels during construction. This potential exceedance of federal air quality standards would be considered a direct, adverse significant impact under NEPA.

What long-term effects will removing 4,000 acres of topsoil have on the air quality of the region? Erosion from clearing is likely to substantially increase the amount of particulate matter that will be airborne during strong wind events. How much water will be used to control dust during construction? Over-runs of estimated water use because of excessive dust is a potential problem.

Traffic: The Energy Commission/BLM proposes a "Heliostat Operating Plan" that would avoid potential for human health and safety hazards, and monitoring would be done for the first 5 years to verify operational safety and respond to any "complaints."□□What liability measures will be taken for recreational visitors who might accidentally get eye damage? This is a strange new hazard for hikers in

Mojave National Preserve and nearby wilderness areas. How will recreational drivers on the re-routed dirt roads that access Clark Mountain, Stateline Wilderness, and Mesquite Mountain Wilderness be protected if they cross the fan slowly and a "malfunction" happens? Such a giant experimental project should not be placed so close to high-use recreational areas and major highways.

□"With regard to power tower receiver safety, the highest intensity of solar radiation □expected to be reflected from a single power tower receiver at its surface would be as □high as 688 kw/m2. However, as noted above, the intensity of reflected light and solar □radiation diminishes as distance from the source increases. Each tower on which each □power tower receiver would be installed would be approximately 140 meters tall (459 □feet). Each power tower receiver would be approximately 20 meters high, therefore the □bottom of each power tower receiver would be located approximately 120 meters (394 □feet) from the ground surface" (page 6.10-17). Brightness of light reflected at the surface of each power tower receiver would be approximately 555,000 cd/m2. The Energy Commission/BLM says this would be too far away for highway motorists to be affected, and would be equivalent to the brightness of a 100-watt light bulb as viewed from a distance of 115 feet. The Energy Commission/BLM admits, however, that this may be a distraction to drivers.□□

If, after measurements are taken of the glowing receiver towers in operation, luminance exceeds 89 cd/m2 at any of the nearest roads and power plant boundaries to each north, south, east and west face of each power tower, the Energy Commission/BLM proposes mitigation measures. We want to know what mitigation measures these would be? Apparently the receivers would have to reduce any luminance below this dangerous threshold, thus reducing power plant efficiency as well.

Health and Safety: A fire protection system would be designed to protect personnel and limit property□loss and plant downtime in the event of a fire. The primary source of fire protection water would be the 250,000 gallon raw water storage tank to be located in each power□block. Approximately 100,000 gallons would be usable for plant process needs and 150,000 gallons would be reserved for fire protection. All fire protection systems would be focused on the power blocks, administration/warehouse building, and other areas of active operations. The project would not include any specific facilities to address potential wild fires. This would put the burden on the counties. How will the applicant address wildfires and increased costs to the county of fire-fighting?

Weed Removal and Control: Weedy successional growth will most likely grow as mirror wash-water falls to the ground during bi-weekly washing. In cooler seasons this would probably result in the increased growth and spread of invasive Red brome grass (Bromus madritensis ssp. rubens), an annual from Europe that favors disturbed ground, as well as various introduced mustards (Brassica spp.). In the summer it would likely be Arabian splitgrass (Schismus

spp.). To take care of this secondary problem, the applicant will carry out a weed management policy and apply "soil binders and weighting agents to minimize dust accumulation on the mirrors and fugitive dust as could occur by wind or vehicle traffic" (page 1-9). What are these soil binders, and are they petroleum products?

What herbicides would be used to remove vegetation from under the heliostats? How will these toxins be prevented from getting into the ground and groundwater? What effects, short-term and long-term would the use of these chemicals have on public health? Will local landowners be at risk? How will these herbicides affect sensitive wildlife and plants? Miles of small roads will be constructed. That has the potential to create a serious weed problem in the area. Invasive plants pose a serious threat to both ecosystem functioning and desert tortoise population viability.

Water Use: We believe the DEIS underestimated the amount of water that will be needed for construction and operation of the project. Dust control during construction will often be more than estimated. What soil types are present on the site, and what is the percentage of silt and clay and components that may be windblown easily? How much water will be used for dust control?

How much water will be needed to wash off the panels? Solar developers consistently give inaccurate accounts of the amount of washing that will be necessary. Blowing dust requires the concentrated thermal unit at Kramer Junction to wash their mirrors every week. Please list the amount of acre-feet for panel washing. Will water softeners be used to prevent spotting? What chemicals are in the softeners? Will they be hazardous to public health and wildlife? Will they compact soils?

How long will water be held in any blow-down ponds associated with generator cooling? Solids and chemicals in this ponded water can enter the groundwater and affect drinking supplies. What will the effects of this water be on the aquifer?

The facilities would require pumping groundwater from a new well for "make-up water" for the steam system it evaporates from the dry-cooling process, and wash water for the heliostats, as well as potable water for domestic water needs. Approximately 16,000 gallons of water per night would be used for mirror washing (that would be almost 6 million gallons per year if trucks ran every night, 18 acre-feet, although the applicant seems to need more as elsewhere they say they need 42.6 acre-feet per year for washing). Which number is correct?

The applicant estimates project water consumption would not exceed a maximum of 100 acre-feet per year. But the applicant doubled the proposed number of mirrors on each heliostat and changed the mirror array fields from what was originally proposed, and then wanted more water. CEC and BLM were

not pleased with this new demand: "Although this change increased the total surface area of all the mirrors combined by approximately 61.4 percent, the applicant has stated that the project's water demand would not exceed 100 AFY. Will more water eventually be needed, and how will BLM work with the applicant of this happens?

In a very circuitous argument BLM and CEC conclude that impacts to the groundwater supply and quality would be "less than significant." Precipitation recharge in this basin is low: the Environmental Protection Agency, when analyzing the Ivanpah Valley Aquifer for the Coliseum Mine in the 1990s, was concerned about overdrafts from any water extractions, as the annual recharge is so small (only 800 acre-feet per year) (Reference: http://epa.gov/waste/nonhaz/industrial/special/mining/techdocs/gold/goldch3.pdf).

BLM and CEC quote two different groundwater studies from the that estimate 1,275 and 1,607 acre-feet per year of recharge, two other studies from 2000 that range from 2,845 to 5,800 afy, and a study in 2008 that estimated 2,806 afy. Conveniently, a study done by the applicant and another by CEC recently estimated a high of from 5,223 to 6,200 afy. No surprise here, those with most at stake found the most water to use. (As an aside three of the studies are missing in the references.)□□

Primm Valley Golf Club near the site uses 1,741 acre-feet per year, and the town of Primm, Nevada 1,470 afy, according to the FSA/DEIS (page 6.9-31). Mining uses 1,060 afy, and the town of Jean 740 afy. Already this spells trouble if you doubt that the recharge is high in the basin, but CEC and BLM use the highest estimates to claim that there is no overdraft and that pumping by the applicant will be just fine.□When will the public be able to review the applicant's monitoring program to identify what changes are occurring in basin water levels?

The DEIS says: "This reduction in basin storage and water levels could translate into basin-wide impacts…. Staff believes that although the magnitude of long-term potential declines cannot be predicted, the ENSR 2007 modeling results and aquifer characteristics suggest the time for basin wide water levels to decline substantially can take centuries and potential impacts during the life of the project and reasonably foreseeable projects would not be significant" (page 6.9-32).□How does BLM know that groundwater lowering may not happen in a few decades?

"Based on the results of this groundwater modeling, the project's groundwater pumping is expected to cause local groundwater levels to decline over the project's 50-year life... Measurements in 2007/2008 suggest, the groundwater level in Coliseum well #1 may be below the top of the well screen, during some times of the year. Where drawdown lowers water levels below well screen elevations there is the potential for impacts due to incrustation and sedimentation of a well. Incrustation and sedimentation would result in increased maintenance

costs and shortened life of the well and pump components. Because part of the well screen of Coliseum well #1 may already be exposed during current pumping, significant impacts may already be occurring" (page 6.9-34). This is too risky to allow more groundwater pumping, especially considering cumulative impacts. The project should not be approved.

Also, "Staff understands that use of the wells at the Primm Valley Golf Club has been reduced due to intrusion of brackish water that was not suitable for landscape irrigation (Broadbent 2002). The cause of the intrusion was believed to be due to pumping induced migration of saltier groundwater underlying the playa to the east" (page 6.9-37). (Broadbent and Associates, Inc. August 2, 2002. Groundwater Issues in the Ivanpah Valley, Nevada and California.). There is a concern over impacts to springs used by the local Bighorn sheep herd. In a visit in early December, 2009, we found bighorn sheep sign on a ridge trail leading down to Willow Spring at the base of the mountain, a few miles above the ISEGS project site. CEC/BLM denied any impacts would result from the project's groundwater pumping. We think this is an assumption, as little appears to be understood of the groundwater in the area.

Storm Water Drainage: The proposed project site is located on an alluvial fan that acts as an "active stormwater conveyance" between the Clark Mountain Range to the west and the Ivanpah Dry Lake to the east. Widespread bajada flooding events and sheetwash deposition was noticed by surveyors. A total of 1,973 ephemeral washes were mapped on the project, 16 being "category 1= 36 to 85 feet wide." The applicant wants to build a delicate project where each mirror must be configured exactly using computer precision so that sunlight beams will hit distant tower receivers -- any deviation could cause damage to the tower -- on an active floodwash fan with anastomosing channels that move over time unpredictably.

The applicant’s proposed stormwater design and management system is a "Low-Impact Development design" which "attempts to minimize disruption to natural stormwater flow pathways." But the amount of grading would still be enormous, and does not outweigh the impacts to the land, water, washes, vegetation, wildlife, recreational use, and views.

"Satisfactory completion of the heliostat pole installation testing by the applicant to either confirm or update its current installation plans followed by further evaluation by staff of whether there would be any impacts related to the method of construction or failure of the heliostats due to storm water flows" (page 6.9-2 digital copy)."The applicant is currently designing and evaluating methods of post installation and heliostat construction. The results are not available for this analysis, but are expected to be submitted to staff at a later date" (page 6.9-14). The public is not able to review how the applicant will install the heliostats to withstand flooding until after the project is approved? This is not acceptable. Please give a detailed account of results of all tests and all methods in the EIS.

The document says, "staff considers that the proposed project does constitute an unusual circumstance. The proposed project is of a very large scale compared to other projects constructed on active alluvial fans in the past. Although modeling and calculations can be used in an attempt to estimate future scenarios and provide a basis for structural design parameters, these methods are based on assumptions and projections that are imprecise and untested in this environment. Should these assumptions and calculations be inaccurate, the consequences of flash flood damage or modified sedimentation and erosion rates may be significant" (page 6.9-19). BLM and CEC recommend mitigation and minimization measures that they hope will alleviate these worries, but they pose too many risks to a healthy, functioning ecosystem and valuable recreational resource to risk. This is a very bad location to test an experimental power plant design, and the project should not be approved.

The consequences of allowing flooding through the project would be too great. Looking at the quiet desert landscape it can be easy to underestimate the violence of a summer thunderstorm or El Nino winter flood.
We have witnessed storm cells in Death Valley cause huge flash floods that have moved car-sized boulders down mountain canyons and destroy small buildings. The 2004 flood in Furnace Creek Wash dug out a new channel, took out the highway, and unfortunately caused the deaths of a few tourists who attempted to drive through the water loaded with moving boulders. Even floods that do not move large debris can damage structures over time with the slow build-up of sand, gravel, stones, and logs, against fences, bending them down.

Recent paleoclimatological studies measuring high stands of lakes in desert playas and flows in desert rivers, such as the Verde in Arizona, have shown that the "statistics if extreme flows derived from twentieth century records are not representative of all hundred-year episodes of the past 1,400 years,...information of value for engineering applications as well as ecological understanding" (Redmond, Kelly T. 2009. Historic climate variability in the Mojave Desert. In, The Mojave Desert: Ecosystem Processes and Sustainability. Edited by Robert H. Webb, Lynn F. Fenstermaker, Jill S. Heaton, Debra L. Hughson, Eric V. McDonald, and David M. Miller. University of Nevada Press: Reno and Las Vegas.).

This is critical: in our lifetimes we may not have even seen the largest flood events that could occur in the desert. Historical records of rain in Ivanpah Valley cannot be used as predictors of future weather.

Reinforcing heliostats will increase construction costs. The FSA/DEIS says that a
"Drainage, Erosion, and Sedimentation Control Plan has been developed to mitigate the potential storm water and sediment project-related impacts. However, the calculations and assumptions used to evaluate potential storm

water and sedimentation impacts are imprecise and have limitations and uncertainties associated with them. Given the uncertainty associated with the calculations, the magnitude of potential impacts that could occur cannot be determined precisely" (page 1-27). This again should be reason for the No Action alternative.

The project could impact recreational use of Ivanpah Playa as well as tortoise habitat. We still do not understand how gravel, rocks, and woody debris will be allowed to "pass through the site in an uninterrupted manner" (page 6.9-26), when fencing around the project will include a tortoise exclusion fence consisting of 1-inch horizontal by 2-inch vertical galvanized welded wire installed to a depth of 12 inches, and extending 22 to 24 inches above the ground surface and integrated with the security fence. This will surely cause debris dams.□□

CEC/BLM may allow " design modifications to address ongoing issues. This may include construction of active storm water management diversion channels and/or detention ponds."□□"For activities outside of the approved right-of-way, the applicant will notify BLM and acquire environmental review and approval before field activities begin." This is unfair to the public -- if the applicant wishes to completely redesign its flood control plan for the entire project because it did not foresee the active nature of this fan, a new environmental review process should be initiated. And if giant berms, diversion channels, and other artificial flood control projects are going to be built outside of the project right-of-way, then this is just another cumulative impact on the valley, as more public land will be graded, more tortoises moved, more rare plants destroyed.□□

CEC/BLM require almost impossible feats of control from the project workers during operation: "Forty-eight (48) hours prior to each potential storm event, the applicant □must visually observe and implement appropriate corrective action for: ...all storm water drainage areas, to identify any spills, leaks, or uncontrolled pollutant sources, ...any storm water storage and containment areas" (page 6.9-88). Workers must also collect water samples after storms and analyze their water quality and report to the Lahontan Regional Water Quality Control Board.□Will the public be allowed to review these reports, since the project will be on public land?□

Visual Resources: BLM) and CEC concluded that the proposed Ivanpah Solar Electric Generating System project would result in a "substantial adverse impact to existing scenic resource values" as seen from the Ivanpah Valley and Clark Mountains.

The project directly adjoins a national park unit and two designated wilderness areas, and a recreational land-sailing site of regional or greater importance on

Ivanpah Playa. BLM and CEC were uncertain as to the level of discomfort or disability glare from the solar tower receivers, and were concerned about the cumulative visual effects of renewable projects on the California Desert Conservation Area and Mojave Desert as a whole. "Staff also concludes that the proposed ISEGS project, particularly the solar receiver units atop the solar power towers, would generate conspicuously bright levels of glare for most or all viewers. This glare, while not representing a hazard, could represent a strong, visually dominant feature as seen from the viewpoints named above, and could strongly alter the character of views of Clark Mountain from the valley floor, interfering with the public's ability to enjoy those views. Staff concludes solar radiation and light reflected from proposed project heliostats could cause a significant human health and safety hazard to observers in vehicles on adjacent roadways or air traffic flying above the site, and could cause a distraction of drivers on I-15 that would lead to road hazards and to pilots of aircraft flying over the site" (page 1-31). "A feature of this desert landscape is the potential for large projects to be seen over great distances where elevated viewpoints exist, due to the large open areas of level topography and absence of intervening landscape features" (page 6.12-8).

"Both the Mojave National Preserve (MNP) and BLM Wilderness Areas (WAs) are regarded as high viewer concern locations due to their special designated status. This fact is amplified by the high visitor numbers reported by the National Park Service in surveys of visitors to the Clark Mountains cited below. This, in combination with the exceptional scenic quality of the mountains in both the MNP and WAs, and the high project visibility from these elevated viewpoints, would result in a high overall sensitivity rating" (page 6.12-10).

How will the applicant mitigate the disruption of views and scenery of these popular tourist and recreation areas?

The National Park Service estimates that 576,840 people visit Mojave National Preserve, and as many as 51,915 visit Clark Mountain. "The overall area of the three proposed project phases would be approximately 6.4 square miles or 4,073 acres, most of which would be occupied by mirror fields. Under the modified project plan, there would be one power tower each at Ivanpah 1 and 2, and five towers at Ivanpah 3. All proposed towers would have an overall height of approximately 459 feet (140 meters), with an additional 5 to 10 feet of FAA-required lighting. Mirror array units would be approximately 12 feet (4 meters) tall.... Power towers would require day and night FAA strobe lighting. Other visually prominent structures would include steam turbine generators, air-cooled condensers, water storage tanks, a 16-acre substation, administrative and maintenance facilities, and new transmission lines and towers (described below). Of these the most prominent would be the Ivanpah 1 air-cooled condenser (approximately 92 feet in height)...; and new transmission towers" (page 6-12-

12). We are unclear on the structure and size of any evaporation ponds.□□

"At certain times of day, diffused glare from the mirror surfaces would be prominent, similar to a lake surface in sunlight; at other times it would not, as in this simulation" (page 6-12-22). How will recreationists be affected by this glare? Will tourism suffer in Mojave National Preserve?

Considering a Key Observation Point at Umberci Mine, a popular hiking destination in Stateline Wilderness Area, the FDA/DEIS states: "Impact Significance –This strong level of overall project visual change contrast would not be compatible with the moderate overall visual sensitivity of the Ivanpah Valley, nor with the high overall visual sensitivity of the Stateline Wilderness Area in which this viewpoint is located. This level of impact is thus considered to be a significant visual impact" (page 6-12-25). No mitigation would be available. Because of this, the No Action alternative should be chosen.

The Visual Resources section of the FSA/DEIS lacks significant information about the potentially negative impacts that lighting from the facility would have on the wilderness values of the adjacent Mojave National Preserve, Stateline Wilderness Area and the Mesquite Mountains Wilderness Area. Potential impacts to recreational activities such as star gazing to visitors of these conservation areas is left out.□"Nighttime construction lighting, without adequate mitigation, could result in light pollution □affecting the Mojave National Preserve," says the FSA/DEIS (page 6-12-27). "FAA-required aircraft safety lighting, which is anticipated to include bright strobe lighting atop the 7 project towers, could not be shielded to prevent upwardly directed light" (page 6.12-30). The FSA/DEIS underestimates how many Mojave National Preserve visitors stay in Primm hotels. We also think more analysis is needed on how the project would affect the viewscape of Nipton, a popular tourist hotel on the edge of Mojave National Preserve.

Cumulative impacts to visual quality of desert landscapes in Ivanpah Valley are called "considerable" (page 6.12-34). Cumulative light pollution for night skies would occur, and Ivanpah Valley would become "urbanized." Not only this area, but the Mojave Desert California Desert Conservation Area would be regionally affected, according to the Energy Commission.□□"The Mojave Desert and California Desert Conservation Area (CDCA) within which the ISEGS project is located are a unique and highly valued scenic resource of national importance, as reflected by the presence of three national parks and numerous Wilderness Areas within its boundaries. Cumulative Impacts Table 1 identifies 66 solar projects and 63 wind project applications with a total overall area of over one million acres within the CDCA, which is indicative of the interest in public lands for renewable energy generation at a regional level. This figure does not include renewable projects within the Nevada and Arizona portions of the Mojave Desert." □□"With this very high number of renewable energy applications currently filed with BLM, □the potential for profound widespread cumulative

impacts to scenic resources within the □CDCA is clear. These cumulative impacts could include a substantial decline in the □overall number and extent of scenically intact, undisturbed desert landscapes, and a substantially more urbanized character in the overall southern California Mojave Desert landscape. Viewed in the cumulative context of the Southern California Mojave Desert as a whole, potential visual impacts of renewable energy projects are thus considered to be cumulatively considerable and potentially significant" (pages 6.12-33-34).□□

Because of these significant cumulative impacts to the visual quality of the popular California Desert recreation area, the No Action alternative should be considered.

CDCA Plan Amendment: An amendment to the California Desert Conservation Area Plan of this size should undergo its own extensive environmental review.

Private Property: The BLM should examine how siting of large energy projects would impact private property values and quality of life for local communities, such as the Primm Golf Course and Nipton. We would like to request an analysis of the projects impacts to adjacent property owners, property values, and quality of life be addressed in the EIS.

Cultural Resources: During geoarchaeological studies observers found patches of very stable old bajada, bypassed by flood washes and ground disturbance. "A subfossil piñon log (Pinus monophylla) was found on a more recent bajada surface among recently active ephemeral streams. The log is thought to be anywhere from 1,100–3,400 years old and may date the surface on which it was found to that approximate age. This information and the recent inadvertent discovery of an intact historical archaeological site (Temporary field no. ISEGS-02) approximately 1,700 feet to the east of Ivanpah No. 2... demonstrates that, although the bajada is subject to a geomorphic regime of net erosion, the landform provides enough stable surface patches to preserve a representative sample of the historical archaeological deposits that would reflect historic activity on the bajada" (page 6.3-40 on our hard copy of the FSA/DEIS, and page 4.12-42 on the digital cd version).

This is "old growth Mojave Desert scrub" and we found ancient creosote rings also indicating stable land surfaces. These creosote grow clonally outwards in a ring, and may be thousands of years old. These areas may hold cultural features and artifacts and should be thoroughly surveyed before scraping.

We have found at least one old trail running east-west through the middle of the project. This should be preserved and avoided, as it may be an important prehistoric trail, and may connect Clark Mountain with the geoglyph on the small hill, and other areas.

A strange "enigmatic" geoglyph (ISEGS-01) was found next to the metamorphic hill on a small hill next to the middle of the project site (page 6.3-50 hard copy). If a large industrial development is built so close to this geoglyph, it may be vandalized. Therefore the No Action alternative should be considered, as this area may have important cultural values.

What will happen to cultural sites found on the site? Will they be collected and archived or simply destroyed? We request that the applicant be required to document, and avoid all artifacts and features.

The FSA/DEIS admits: "Construction of the solar and wind projects proposed throughout this region would result in substantial changes in the setting and feeling, and association of the areas in which they are constructed. The current design of these projects would result in a significant cumulative impact to the region. Within the desert region there are numerous traditional use areas, and lands sacred to Native Americans are present. Potential impacts would include physical disturbance or alteration directly as a result of construction activity or diminished visual character of traditional use areas due to the presence of industrial structures. If impacts to traditional use areas would occur at any individual site, mitigation would be implemented to minimize project impacts; however the potential for vast disturbance of the desert would potentially lead to a loss of resources and impacts to visual character, thereby resulting in a significant cumulative impact. (page 4.12-72 in the digital version, page 6.3-71 hard copy). The No Action alternative should be taken so as not to disturb this area and lead to cumulative impacts.

Just because large numbers of lithics have not been found on the fan does not mean it is not a significant cultural area, as people may have used it commonly to hunt lizards and rabbits, collect *Lycium* berries, which grow commonly on the project site, and other uses which do not preserve well in the archaeological record.

Native American Tribal Concerns: What are the concerns of local tribes? The applicant and BLM did a poor job of contacting local tribes, and did not contact others, such as the Shoshone, who also have interests in Ivanpah Valley as part of their homeland. We would like a detailed description of all local Native American Tribal concerns written in the EIS.

The proposed project site lies within the homeland of the Chemehuevi. While the DEIS states that cultural sites are insignificant on the project site, we are requesting that BLM organize a site visit with elders of the Chemehuevi tribe. We would also like to request that BLM consider having the applicant submit a new plan that adequately avoids significant cultural resource sites. The Chemehuevi have expressed concern to BLM over the Ivanpah Solar Electric Generating System. While BLM has claimed that they sent all the relevant information to The

Chemehuevi, the Chemehuevi are displeased because they have not been consulted on this project. That is not acceptable. An open line of communication will have to be maintained with the tribes who hold a special interest on this land.

The project area has other tribes that have a cultural history in the area as well. BLM and the applicant should contact them as well and organize site visits.

Biological Resources:

A. Desert Tortoise (*Gopherus agassizii*):

The proposed ISEGS project would be constructed within the Northeastern Mojave Recovery Unit, one of six designated evolutionarily significant units within the range of the Desert tortoise. When the 1994 recovery plan was issued, some of the highest known tortoise densities were in southern Ivanpah Valley, with 200 to 250 adults per square mile (US Fish and Wildlife Service 1994, Desert Tortoise {Mojave Population} Recovery Plan. Portland Oregon). Densities for the northern Ivanpah Valley in the 1990s were typically less than 50 adults per square mile (ibid.). Ivanpah Valley area is considered excellent quality tortoise habitat with some of the highest population densities in the East Mojave. The FSA/DEIS states: "The project, combined with future proposed projects, would also significantly affect a genetically distinct subpopulation of desert tortoise within the Northeastern Mojave Recovery Unit that occurs in the Ivanpah Valley..." (page 6.2-71). The proposed project is located approximately five miles north of the Ivanpah Critical Habitat Unit for desert tortoise, just north of the I-15 and Route 164 (Nipton Road) interchange.

The 2007/2008 protocol desert tortoise surveys found 25 live desert tortoises, 97 desert tortoise carcasses, 214 burrows, and 50 other tortoise sign. Tortoise sign and density was greatest in Ivanpah 1 at the southern boundary of the project site and was less dense as the survey moved towards the Clark Mountains and Ivanpah 3, according to the FSA/DEIS. On several October visits to the sites, we found numerous burrows on the northern part of the site, however.

Survey methodology: We believe that more surveys will need to be conducted to get a more accurate estimate of population density, such as mark-recapture or line-distance sampling. We would like to request surveys be conducted yearly to the fall of 2012.

What type of survey methods were used to declare only 25 tortoises are on the preferred project site? Any biologist will tell you that an estimate like this holds little weight. It could very well be that there are three times that many. How many surveys were conducted? Were they reconnaissance surveys? Was this number only determined by presence/absence surveys? We would like to caution the BLM against accepting these as the final numbers. Additional surveys will be

needed for a more accurate estimate.

Health status: What is the health status of this population? Were any symptoms of Upper Respiratory Tract Disease detected? If so, was this just a visual survey? Will desert tortoise be given the ELISA blood test before they are translocated? We would like to request that the applicant be required to conduct blood work on all tortoise to be translocated.

Cutaneous dyskeratosis is a shell disease that has unknown implications on desert tortoise populations. In advanced cases, exposed areas become infected with bacteria, fungus, and exposed tissue and bone may become necrotic. Cutaneous dyskeratosis has been identified on the Ivanpah Desert Wildlife Management Area. Hypotheses for the cause of the disease include auto-immune diseases, exposure to toxic chemicals (possibly from mines, or air pollution), or a deficiency disease (possibly resulting from tortoises consuming low-quality invasive plant species instead of high-nutrient native plants). We are concerned that destructive events such as flash flooding will release chemical residues into the ecosystem, thus having the potential to intensify this problem. We would like to request a study on the impacts of hazardous materials and other toxins potentially released by the proposed project would have on desert tortoise populations relating to the disease cutaneous dyskeratosis.

Habitat Quality and Connectivity: The applicant dismisses the project site as a category three habitat and claims that the project site is not essential to maintenance of viable populations.

We would like to remind BLM and the applicant that protection of the tortoise does extend outside of just critical habitat or DWMA's. The project site is located in a topographically favorable region with excellent habitat. This region of the project site is important to maintain as undeveloped because it provides connectivity between and within recovery units of the desert tortoise.

Mitigation: The compensatory mitigation plan for tortoises relies on so-called "nesting" to provide compensatory mitigation for loss of habitat and individuals for multiple plant and animal species. Because the plan described in the FSA/DEIS only addresses desert tortoise habitat, it may in fact be inadequate to provide for the mitigation needs of the many other species that will be impacted by the project. We believes that the Energy Commission and BLM must revisit this issue and explain how the so-called "nesting" of mitigation actually provides for compensatory mitigation for each species of rare or sensitive plant and animal, including listed species as well as Gila monster, burrowing owl, nesting bird species, badger, and Nelson bighorn sheep.

The FSA/DEIS provides little information on the translocation site and survey protocol that was used to determine the feasibility of the site. We are concerned that the applicant did not follow protocol during the surveys of the translocation

site. We feel that the following questions deserve an answer and that the applicant should be more cooperative about sharing this basic information. The below issues concerning the translocation plan remain unresolved in our view:□□□

1. Please submit copies of all desert tortoise pre-project survey data sheets.□

2. Please submit resumes of Southern Nevada Environmental, Inc (SNEI) surveyors. □□

3. Please indicate the personnel that had a minimum of 60 days prior field experience searching for desert tortoises and tortoise sign. □□

4. For surveyors without 60 days prior field experience, provide a discussion of how surveyors were trained and any measures that were taken to ensure they obtained accurate survey results. □

5. Please provide dates and times of tortoise surveys. If surveys were not conducted during appropriate seasons (April through May and September through October) as determined by U.S. Fish and Wildlife Service (USFWS) April 2009 Pre-Project Field Survey Protocol (http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/dt/DT_Pre-project_SurveyProtocol_2009_FieldSeason.pdf), please explain the reasons. Was approval granted for any survey work conducted outside the spring and fall seasons by USFWS and California Department of Fish and Game (GDFG)? □□

6. If surveys were conducted outside recommended USFWS protocol seasons, please discuss how survey numbers would be as accurate as those obtained during optimal activity seasons.□□

7. Please provide temperature data collected during surveys. Were surveys conducted when air temperatures were above 40 degrees Celsius? □□

8. Please indicate whether any desert tortoises were handled during Project surveys. If tortoises were handled, please provide documentation of the section 10(a)(1)(A) permit(s) issued by the USFWS authorizing handling. □□

9. In the ISEGS Supplemental Data Response Set 2J, SNEI indicates that rainfall estimates were not obtained on site, but at higher elevations from Mountain Pass in different habitat, and approximately 50 miles away at Las Vegas. Please discuss how tortoise abundance estimates may be skewed by rainfall estimates that are not on site. □□

10. In the ISEGS Supplemental Data Response Set 2J, SNEI concludes that drought may be the prime cause for a possible decline in tortoises on the site. Please discuss why other potential causes for this decline were not discussed,

such as disease, subsidized predation relating to the interstate highway, and livestock use.

Translocation site: Recent translocations of tortoises at Ft. Irwin, California, however, failed and were halted, as coyotes began finding and killing large numbers of tortoises after they were moved to new locations. The California Department of Fish and Game (CDFG) and US Fish and Wildlife Service (USFWS) have concerns about the outcome of proposed desert tortoise translocations for the ISEGS project, and have requested that those concerns be addressed in any relocation/ translocation plans approved for the ISEGS project. Please address this.

Protection Status: Unless the No Action alternative is taken and cumulative degradation and fragmentation of habitat is avoided, we are concerned that the desert tortoise this northeastern Evolutionarily Significant Unit will be upgraded from Federally Threatened to Federally Endangered.

B. Gila Monster (*Heloderma suspectum*): The FSA/DEIS states that the "compensatory mitigation plan, could offset the loss of habitat for this species and reduce the impact to less-than-significant" (page 6.2-47). The needs of the Gila monster may not be consistent with the needs of the tortoise. A separate mitigation plan should be developed for Gila monster, with separate mitigation land acquired if needed. The California Department of Fish and Game agreed that compensatory mitigation for Desert tortoise used to offset impacts to Gila monsters is inadequate. The Gila monster is a fossorial species that is very difficult to locate. The FSA/DEIS does not explain what kind of surveys were used to look for the species.

The BLM and CEC need to have qualified individuals do more complete surveys of the area for the species before any conclusions are made about population numbers. Populations of this species in the Mojave Desert are fringe populations and could carry unique genetic bottleneck traits that should be researched.

C. Burrowing Owl (*Athene cunicularia)*: All burrowing owls should be passively removed and not actively removed or excavated from their burrow. (Passive meaning wait for the owl to come out). Avoidance of owls and restructuring of the project site may be necessary. California Department of Fish and Game protocols (Burrowing Owl Survey Protocol and Mitigation Guidelines. 1993. Prepared by the California Burrowing Owl Consortium. www.dfg.ca.gov/wildlife/nongame/docs/boconsortium.pdf, accessed November 10, 2009) will need to be implemented. The guidelines recommend that for off-site mitigation, replacement of occupied habitat with 9.75 acres of occupied habitat per pair or single owl found, or 13 acres of contiguous habitat per pair or single bird, or 19.5 acres of unoccupied habitat per pair or single bird.

D. Birds: The FSA/DEIS fails to mention several additional state and federal

sensitive species that potentially occur on the site: □□

CDFG Species of Special Concern:

Mountain Plover – potential habitat. Also CA BLM sensitive species.□

Northern Goshawk – migrant and summer sightings on Clark Mountain (potential breeder) (Source: Arnold Small. 1994. California Birds: Their Status and Distribution. Ibis Publishing Company: Vista, CA). Also CA BLM sensitive species.□

Northern Harrier - migrant.□

Long-eared Owl – migrant, wintering.□

Short-eared Owl – migrant, wintering.□

Black Swift – migrant.□

Lucy's Warbler – migrant.□

Yellow Warbler – migrant, breeds in Providence Mountains (Small 1994).□□

Fish and Wildlife Service - Birds of Conservation Concern:

Ferruginous Hawk – migrant, wintering.□

Peregrine Falcon - migrant.□

Whip-poor-will – rare breeding population on Clark Mountain (Small 1994).□

Costa's Hummingbird – summer resident.□

Calliope Hummingbird - migrant.□

Lewis's Woodpecker - migrant.

Williamson's Sapsucker - migrant.□

Willow Flycatcher - migrant.□

Sage Thrasher - migrant.□

Cactus Wren – permanent resident, breeder on site. Basin and Range Watch found nest on site in 2009.

The FSA/DEIS states that loss of nesting and foraging habitat for the special-status bird species would adversely affect populations of these species within the Ivanpah Valley. The “compensatory mitigation plan could offset the loss of habitat for these species and reduce the impact to less-than-significant” (page 6.2-45). The needs of the dozens of sensitive birds present may not be consistent with the needs of tortoise. A separate mitigation plan should be developed for sensitive bird species.

Another serious problem with this type of solar development, not present in parabolic trough plants, is the superheated beams reflected through the air over the heliostat fields onto the central receiver towers. Migrating or foraging birds have been burned to death flying through these beams.

The paper AVIAN MORTALITY AT A SOLAR ENERGY POWER PLANT, by Michael D. McCrary, Robert L. McKernan, Raplh W. Schreiber, William D. Wagner, and Terry C. Sciarrotta, Journal of Field Ornithology, 57(2): 135-141 (pdf >>here), found that Solar 1 during 40 weeks of study, caused 70 bird fatalities involving 26 species, most from collisions with both heliostats and tower, but thirteen (19%) birds (of 7 species) died from burning in the standby point. Heavily singed flight and contour feathers indicated that the birds burned to death. Six (46%) of these fatalities involved aerial foragers (swifts and swallows) which are apparently more susceptible to this form of mortality because of their feeding behavior.Will any water in ponds attract birds? Even if no ponds are present, birds in the area may fly through the project and be killed.

We have seen Gray vireos in Ivanpah Valley migrate low through creosote bush stands. These species could be significantly impacted by the solar field. Other rare nesting species on Clark Mountain could similarly be affected. How will the applicant mitigate impacts to rare migratory breeding birds on Clark Mountain?

Raptors potentially resident or migratory on the site that could be adversely impacted by towers:

Merlin
American kestrel
Prairie falcon
Peregrine falcon
Northern harrier
Swainson's hawk
Ferruginous hawk
Rough-legged hawk
Osprey
Bald eagle
Golden eagle
Sharp-shinned hawk
Cooper's hawk

Northern goshawk □□

A discussion of how negative affects of collisions and burning by towers during operation will be minimized and mitigated for raptors, migratory species, other birds, and bats flying during the day needs to be included in the FSA/DEIS.

E. American Badger (*Taxidea taxus*): The FSA/DEIS states that the project would induce a large loss of Badger habitat and population within Ivanpah Valley. The "compensatory mitigation plan could offset the loss of habitat for this species and reduce the impact to less-than-significant" (page 6.2-46). The needs of the Badger may not be consistent with the needs of the tortoise. A separate mitigation plan should be developed for the Badger. No minimization plans are discussed.□□

The applicant plans to conduct Badger surveys during the desert tortoise clearance survey. If tracks are observed, the applicant would develop and implement a trapping and relocation plan. This plan should be developed now, for public review.

F. Bats: The FSA/DEIS mentions only three sensitive bat species that may occur in the area:□Townsend's big-eared bat (*Corynorhinus townsendii),* Pallid bat (*Antrozous pallidus*), and Long-legged myotis (*Myotis volans*). □

Many other sensitive bat species potentially occur at the site, that are not discussed:□□

California BLM Sensitive Species:□

California leaf-nosed bat (*Macrotus californicus)* □
Spotted bat (*Euderma maculatum)* □
Western mastiff-bat (*Eumops perotis californicus*) □
Fringed Myotis (*Myotis thysanodes*) □
Small-footed Myotis (*Myotis ciliolabrum*) □
Long-eared Myotis (*Myotis evotis*) □
Yuma Myotis (*Myotis yumanensis*)□□

Cal. Species of Special Concern:□

Big free-tailed bat (*Nyctinomops macrotis)* □
Arizona Myotis (*Myotis occultus*) □
Western red bat (*Lasiurus blossevillii)* □
Western yellow bat (*Lasiurus xanthinus*)□□

An assessment of project impacts on these species should be done, with a discussion of whether any additional species-specific mitigation will be implemented to offset project impacts.□□

The FSA/DEIS says that to minimize risk of avian collisions with the heliostat towers, only flashing or strobe lights shall be installed on these towers. Lower facilities will also have lights that may attract bats. The FSA/DEIS does not discuss affects of night lighting on bats in the area. Insect swarms attracted to lights may lead to bat collisions. Monitoring of impacts to bats, including mortality found on-site, should be discussed with reduction of artificial lighting proposed as a potential.

G. Nelson's Bighorn Sheep (***Ovis canadensis nelsoni***): There is a potential that bighorn sheep will use this site for winter foraging. How would development of the alluvial fan impact potential desert bighorn winter forage habitat? Bighorn will often cross alluvial fans and desert floors. How would construction of such a large facility impact connectivity of bighorn sheep populations and migration corridors?

The FSA/DEIS fails to fully analyze impacts to bighorn, provide alternatives to avoid impacts, or provide measures to minimize impacts. For example, we do not believe building an artificial guzzler would mitigate for the potential loss of springs on the mountain slopes and bajadas due to groundwater pumping. How this mitigation will make up for the removal of bajada habitat used for feeding by bighorn sheep, as well as movement corridors between ranges. How will a guzzler offset loss of forage and habitat?

A pre-construction baseline of bighorn sheep use should be established, followed by intensive monitoring during construction and follow-up post construction. We are not convinced that project water pumping will not have an adverse effect on the surrounding springs and seeps that are so precious to the resident wildlife population. Please analyze potential affects to Bighorn sheep springs.

H. Mule deer (*Odocoileus hemionus*): Deer also occupy Clark Mountain, and we have seen deer traveling through lower-elevation fans and basin edges in creosote-Mojave yucca habitat elsewhere in the Mojave Desert. Please analyze impacts to Mule deer foraging habitat, watering areas, and movement corridors by the project.

I. Rare Plants: Rusby's desert-mallow is considered by the California Native Plant Society to be especially of concern, and is on its List 1B - Rare, threatened, or endangered in California and elsewhere. Rusby's Desert-Mallow is a California endemic perennial herb; it is documented globally from less than 30 occurrences in Inyo and San Bernardino Counties in the Death Valley Region and eastern Mojave Desert in the Clark Mountain Range. It has a California Natural Diversity Database state rank of S2 (imperiled). It occurs in the Clark Mountain Range at Ivanpah Springs, on desert slopes and gravelly sandy washes and often in carbonate and limestone substrate, extending into the project area. This plant is also a BLM-sensitive plant species detected on site. This plant would be

significantly impacted by the project, its range fragmented and individual plants and seeds in the soil potentially destroyed. Impacts are unmitigable, and therefore the project should avoid this area completely.

Mojave Milkweed is limited to a very small area in eastern San Bernardino County. Currently, it is known from less than 25 occurrences, 16 of which occur in Ivanpah Valley in the project area. Its distribution outside of Ivanpah Valley is limited to a few very old historic collections and only two other populations that have been confirmed extant. This plant also occurs in Arizona, New Mexico, and Nevada but it has a California state rank of S1 (critically imperiled and vulnerable to extirpation from the state due to extreme rarity). Similarly, impacts to this species are unmitigable and the project should avoid this area.

Other rare plants are somewhat more widespread, but taking into account the cumulative impacts of the dozens of other large utility-scale solar applications pending in the desert, this is little comfort: Small-Flowered Androstephium (Androstephium breviflorum), Utah Vine Milkweed (Cynanchum utahense), and Desert portulaca (Portulaca halimoides).

Surveys were not carried out in for summer-rain germinating species, and thus several plant types may have been missed or under-represented. Fall surveys should be undertaken, for this summer-rain influenced part of the Mojave Desert.

We agree with the California Native Plant Society that there are no known techniques to mitigate for the loss of rare plants and their habitat in desert environments. Avoidance is the only mitigation that is appropriate for this site. There is no known method to compensate for the loss of this rare plant habitat. Simple habitat acquisition for the desert tortoise cannot provide adequate compensation for the loss of this high quality rare plant habitat. To be able to find comparable compensation habitat for the rare plants will require an enormous amount of fieldwork to survey private lands that might be occupied. Simple translocation of the adult plants does not perpetuate population structures for long-term productivity and is an unproven mitigation for habitat destruction. The scale of destruction of subsurface ecosystem components and seed banks is impossible to mitigate.

Currently, there are no known mitigation actions that are successful for desert plants and habitats. The only legitimate option is, no approval at this location. If approved for this location, a land compensation ratio should be at least 5:1, especially in light of the massive push for energy development in the desert and the projected cumulative effect generated from similar projects.

Transplantation was brought up, but studies have found that, even under optimum conditions, transplantation was not effective in 85 percent of cases. The California Native Plant Society has an official policy opposing transplantation. Even if avoidance for any rare plants could be achieved, this plan still allows the

habitat of these species to be carved up and fragmented, creating islands of habitat isolated from other populations and potentially even pollinators due to the heat created by the project's sun-reflecting and concentrating design. This does not provide adequate minimization to the severe impacts to these populations.

J. Cacti: We strongly suggest no cacti be sold from the site if the project is approved.

K. Biological Soil Crusts: Biological soil crusts are formed by living organisms and their by-products, creating a surface crust of soil particles bound together by organic materials. Crusts are predominantly composed of cyanobacteria , green and brown algae, mosses, and lichens. Liverworts, fungi, and bacteria can also be important components.

Crusts contribute to a number of functions in the environment. Because they are concentrated in the top 1 to 4 mm of soil, they primarily affect processes that occur at the land surface or soil-air interface. These include soil stability and erosion, atmospheric nitrogen fixation, nutrient contributions to plants, soil-plant-water relations, infiltration, seedling germination, C02 offsets and plant growth. Crust-forming cyanobacteria have filamentous growth forms that bind soil particles. These filaments exude sticky polysaccharide sheaths around their cells that aid in soil aggregation by cementing particles together. Fungi, both free-living and as a part of lichens, contribute to soil stability by binding soil particles with hyphae. Lichens and mosses assist in soil stability by binding particles with rhizines/rhizoids, increasing resistance to wind and water action. The increased surface topography of some crusts, along with increased aggregate stability, further improves resistance to wind and water erosion. Crusts can alter water infiltration. Studies where crusts greatly increase surface roughness generally have increased infiltration with the presence of crusts. Where crusts do not significantly increase surface roughness, infiltration is generally reduced due to the presence of cyanobacterial filaments. Differences in findings are therefore site specific and also related to soil texture and chemical properties of the soil.

Living soil crusts also store C02 and their removal may contribute to a lack of organic offsets anthropogenic greenhouse gas emissions. It would be a wise idea for BLM to calculate the amount of C02 that the removal of 4,000 acres of soil crust and vegetation would offset.

L. Rare Plant Communities: The applicant decided that no rare plant communities are present at the site. A cursory look around, however, and comparison with source material, makes us question this finding. □□□□

In A Manual of California Vegetation, second edition, by John O. Sawyer, Todd Keeler-Wolf, and Julie M. Evens, 2008, California Native Plant Society and California Department of Fish and Game, the authors say that for the *Larrea tridentata-Ambrosia dumosa* Shrubland Alliance (Creosote bush-white burr sage

scrub): "The presence of several non-native plants, particularly *Brassica tournefortii, Bromus* spp., and *Schismus* spp., has greatly increased fire frequencies and led to the degradation and destruction of many hectares of this alliance. Long-term, intensive grazing, OHV activity, mining, and military operations have also left their mark.... We need to identify, monitor, and manage areas free of these degrading influences" (page 568).□□

The Ivanpah Valley fan site is just such a large intact area of creosote-bursage scrub that is relatively free of weeds, has only light (and easily reversible) grazing, almost no off-roading except on three designated tracks, and no other development disturbance. We recommend it be preserved and protected.□□In addition, the authors state that such associations with *Pleuraphis rigida* (Big galleta grass), and "those with a diverse shrub layer are G1 S1" (page 566). The G1 S1 (Global 1 State 1) status rank means the plant community is rare and has "fewer than 6 viable occurrences worldwide/statewide, and/or up to 518 hectares" (page 45). The Ivanpah site plant community has galleta grass and a diverse shrub layer and is worthy of more studies to determine its status.

A quick check of the California Natural Diversity Database (http://www.dfg.ca.gov/biogeodata/vegcamp/pdfs/natcomlist.pdf) shows other rare communities that could be present on the Ivanpah site:□□

*33.010.07 Creosote Bush-White Ratteny-Big Galleta [*Larrea tridentata-Krameria grayi-Pleuraphis rigida*] (Keeler-Wolf et al. 1998).□□□

*33.010.14 Creosote Bush - Big Galleta - Anderson's Wolfberry [*Larrea tridentata-Pleuraphis□rigida-Lycium andersonii*] (Keeler-Wolf and Thomas 2000).

*33.140.17 Creosote Bush - White Bursage - Big Galleta [*Larrea tridentata-Ambrosia □dumosa-Pleuraphis rigida*] (Keeler-Wolf and Thomas 2000) .□□

33.140.33 Creosote Bush - White Bursage - Barrel Cactus [*Larrea tridentata-Ambrosia □dumosa-Echinocactus polycephalus*] (Keeler-Wolf and Thomas 2000) □□

*33.140.35 Creosote Bush - White Bursage - Cryptogrammic crust [*Larrea tridentata-* □*Ambrosia dumosa*-Cryptogrammic crust] (Keeler-Wolf and Thomas 2000). □□

*33.320.01 Blue Sage [*Salvia dorrii*] (Keeler-Wolf and Thomas 2000). □

"Lead and trustee agencies may request that impacts to these communities be addressed in environmental documents" the website says. (Department of Fish and Game □Biogeographic Data Branch Vegetation Classification and Mapping Program List of California Terrestrial Natural Communities Recognized by The California Natural Diversity Database September 2003 Edition)

M. Ephemeral Washes: Mowing of vegetation, grading, driving compaction, and flash flood damage repair will significantly impact the project site's 198 acres of ephemeral drainages.

"Staff's proposed Condition of Certification BIO-20 specifies that, in addition to minimizing impacts to drainages where feasible, the applicant acquire and enhance property that includes 198 acres of ephemeral drainages similar to those on the ISEGS site. This mitigation could be integrated with the desert tortoise mitigation requirement for acquisition and enhancement of suitable desert tortoise habitat. With implementation of this proposed condition of certification impacts to the project area's ephemeral drainages would be reduced to less-than-significant levels" (page 6.2-63).

What lands will be acquired, and where? A discussion of whether mitigation lands will be one contiguous parcel or many, should be included. Mitigation lands for ephemeral streams should be considered independently of tortoise mitigation lands.

Burros: The Clark Mountain Wild Burro Herd represents a genetically distinct population from a region of Spain that has been historically traced to this area. Wild Horse and Burro enthusiasts are concerned that this herd will be negatively impacted by the project. Many recreationists come to view this herd, and BLM should consider managing a small herd for its unique heritage and viewing opportunities. Cumulative impacts on burros may result from the combination of this proposed project with other current and reasonably foreseeable future land uses, including other solar energy projects.

Cumulative Impacts: In addition to the Ivanpah Valley proposed developments, including solar, wind, train, and other projects, more renewable projects are proposed for the California Desert. In a recent phone conversation with CEC, we were told that ISEGS is "the tip of the iceberg." In the California Deserts the current dozen or so solar thermal projects with applications in represents a mere 4% of the coming applications. That would mean more than 200 industrial-scale solar thermal projects are looking to built on the Mojave and Colorado Deserts in the state. And that does not include large photovoltaic projects on valley floors and utility-scale wind projects on hills and ridges.

We request that BLM carefully consider the cumulative impacts on desert tortoise, bighorn sheep, other wildlife, rare plants and plant communities, water and soil resources, visual resources, and recreational multiple use of both Ivanpah Valley (including Nevada), and the California Desert Conservation Area. Very significant industrialization of scenery, habitat degradation and fragmentation, reduction of soil and vegetation carbon sequestration, water use, loss of tourism dollars, and loss of multiple use on lands outweighs any small benefits of adding a few renewable energy jobs and reducing carbon emissions by a small amount. The large footprint on multiple use land and very small

amount of electricity actually generated leads us to request the No Action alternative, giving stakeholders more time to discuss better siting of these power plants.

Conclusion: While the use of solar energy can be a clean technology, it is not environmentally responsible unless it is sited properly. Because solar energy requires so much space to produce the desired amount of energy from any given project, it will have a massive footprint if it is placed on relatively undisturbed land. The BLM lands in the area of the project site are preserved for multiple use activities, but giving away so much land for energy development only conforms to one user group, energy developers. There are alternatives to this kind of “energy sprawl”.

This project will not mitigate any climate change impacts to the species present in Ivanpah Valley. No desert species of plant or animal would be helped by building this project, as large intact habitats are needed for species movement, gene flow, and adaptation during any climate change occurrences. Maintaining large desert ecosystems as they are under protective management will be a much better alternative to reducing the local and global impacts of climate change.

Human management intervention to help tortoises should not be in the form of building large development projects on habitat, such as the ISEGS project, which have doubtful climatic benefits, but rather conservation biology would recommend removing disturbances from the desert ecosystem, managing for maximum genetic connectivity, and increasing carrying capacity by preserving large, contiguous, intact natural landscapes.

Even if the project could reduce the amount of climate change by a small amount, it would be very difficult to counter the loss of large blocks of healthy mature ecosystems and desert tortoise habitat. Loss of habitat is a crucial factor in elevating the level of protection given to a species. Preserving intact ecosystems is the best way to conserve listed species, rare plants, ecological interactions such as plants and their pollinators, and migration corridors.

For many reasons, we support the No Action Alternative.

Thank you,

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