APPENDIX T

Reasonable Foreseeable Development Scenarios

Geothermal Energy RFD

It is expected that each of the pending geothermal lease sites could support a binary power plant with 50 MW of capacity; therefore, the reasonable foreseeable development (RFD) scenario for this lease-specific analysis is two binary power plants with a combined capacity of 100 MW. Each of the power plants would be expected to result in 25 acres of disturbance for a total disturbance of 50 acres.

Exploration activities for the two 50-MW plants is expected to involve approximately 12 temperature gradient holes, disturbing approximately 0.15 acre each, for a total disturbance of approximately 2 acres. Disturbance would result from the types of activities described under Chapter 2, Phase One: Geothermal Resource Exploration, of the FPEIS for Geothermal Leasing in the Western U.S. (BLM 2008f).

Assuming that commercially viable resources are found within both lease areas, drilling operations and development of the sites would be expected to result in an additional 16 acres of land disturbance (roughly 8 acres within each lease site) from the types of activities described in Chapter 2, Phase Two: Drilling Operations of the FPEIS.

Utilization, the third phase of a geothermal project, is expected to result in an additional 32 acres of land disturbance (roughly 16 acres at each lease site) from the types of activities described in Chapter 2, Phase Three: Utilization of the FPEIS.

The length and alignment of transmission lines are not estimated here, since these factors would depend upon the positioning of any power plant and the distance to the nearest electrical tie-in.

Reclamation and abandonment, the fourth phase of a geothermal project, is expected to result in temporary disturbance of all originally disturbed acres, after which, the site would be graded and revegetated to pre-disturbance conditions, as described in Chapter 2, Phase Four: Reclamation and Abandonment of the FPEIS.

Appendix D of the FPEIS for Geothermal Leasing in the Western U.S. presents the BMP and mitigation measures that would be applied during the approval process for geothermal leasing activities in or adjacent to the Planning Area.

Solar Energy RFD

The Energy Policy Act of 2005 (PL 109-58) requires that the BLM should seek to have at least 10,000 MW of non-hydropower renewable energy electricity approved on public lands by 2015. The BLM and the Department of Energy (DOE) have jointly identified utility-scale solar energy development as a potentially critical component in meeting these mandates. The agencies have further determined that the establishment of specific, agency-wide solar energy programs and related mitigation requirements constitute major federal actions, as defined by NEPA and, thus, have decided to jointly prepare a PEIS. A PEIS evaluates the environmental impacts of broad agency actions, such as the development of programs. The Solar Energy Development PEIS will focus on six western states (Arizona, California, Colorado, New Mexico, Nevada, and Utah) that have the greatest potential for solar energy development on federal lands. The specific agency-wide solar energy programs will consist of guidelines and mitigation requirements applicable, for DOE, to solar energy projects funded by DOE and, for BLM, to solar energy projects located on BLM-administered lands. Future site-specific environmental reviews are expected to be tiered to the PEIS and to be more effective and efficient because of the PEIS.

The two basic technologies typically used are CSP technologies and photovoltaic (PV) technologies. Concentrating solar power (CSP) technologies convert the light energy in sunlight to heat energy which is then used to perform work (e.g., heating water). Utility-scale CSP technologies use mirrors to concentrate the sun's rays to heat fluids or solids, and the heat is used to drive steam turbines or other devices to generate power. Parabolic trough and central tower systems typically use conventional steam plants to generate electricity; these plants commonly consume water for cooling. Some of the CSP technologies offer the potential to store the energy in the working fluid until demand from the grid calls for conversion to electrical energy. PV technologies convert the sun's radiant energy directly to electricity by using solar panels. The PV technologies do not have the capacity for direct storage. For newly constructed solar energy power plants, new or upgraded high-voltage transmission lines and associated facilities could be required.

Photovoltaic cells are made of semiconductor material. When photons from sunlight are absorbed by a PV cell, the energy of the photons is transferred to electrons in the PV cell. As the electrons are freed, current begins to flow in the form of direct current (DC) electricity. Each PV panel is made of multiple cells that are put together with negative (sunny side) and positive (dark side) layers. In large-scale installations, many panels are assembled together to form arrays.

The technical specifications could differ somewhat from the description in this RFD depending upon the PV manufacture chosen. This is because the exact dimensions and precise quantities of solar components required to generate various MWs of power differ between PV manufacturers. Assuming the use of a given thin-film PV technology, the PV modules could be mounted on fixed structures and plugged together to form arrays or blocks. Pre-fabricated wire harnesses and combiner boxes connect the multiple arrays or blocks, provide safety protection, and deliver the DC power to an inverter. The inverter converts the DC power to alternating current (AC) power. The resulting lower AC voltage would be increased to a higher transmission voltage using transformers. A higher voltage provides significantly more efficient transmission of power. The power would then be transmitted to a substation for delivery to the electric grid.

A Site Preparation

Depending on the location of a potential facility, large-scale grading of the site for construction and implementation could be avoided. A minimal level of ground disturbance should allow the site to maintain some of its natural characteristics and habitat value. However, PV blocks require a relatively flat surface for installation. Grading would occur for the construction of all-weather roads, temporary construction staging areas, a facility substation, and the facility administration facility. These areas would be graded, leveled, and graveled. Temporary use areas, including the staging areas and the temporary roads, would only be impacted during the construction period. Roads would be heavily used during construction and rarely used during operation. Staging areas would be utilized during the construction period, and would then be decommissioned and replanted with native vegetation.

A minor amount of grading would be necessary for approximately 200 square feet within each PV block where the transformer and inverter pad would be located. These transformer and inverter pads should add less than 1/10 of 1-percent surface impact from grading.

Trenching machines would be used to bury electrical cables within the PV blocks, and between the inverter and transformer locations and the substation. The cable laying and trench-refilling would occur as part of a single operation, thus minimizing grading impacts from this construction process. The trenches could be between 2 and 4 feet wide, and the trenching machines would disturb a corridor less than 15 feet in width during construction. Trenched corridors should maintain their existing surface contours. Trenching activities could result in site disturbance of approximately 5 percent of the facility site.

B Solar Array Assembly and Construction

Photovoltaic panels would be transported to the staging area in containers on tractor-trailers. From there, the containers would be transferred by crane onto smaller vehicles and brought to the construction location. The PV panels would be put in place manually and could be secured to concrete ballasts resting on grade. A row of panels then would be connected to a combiner box that would deliver power to the inverter box. Invertors and transformers would be installed at predetermined central locations and then connected to incoming lines from the combiner boxes. Once PV block installation is completed, there should be only infrequent low-impact vehicular traffic for inspection and repair purposes on the aisle ways between PV blocks.

Solar arrays could consist of PV panels mounted on fixed steel support structures resting on steel posts. The general sequence of array assembly involves driving galvanized steel post into the ground, installing the fixed-angle galvanized steel tilt brackets, installing the galvanized steel PV panel support beams, and installing the PV panels.

The solar field could be comprised of PV panels mounted on fixed support structures arranged in 1 MW blocks. The solar field layout would comprise rows of panels oriented from east to west, with the panels facing the south. The spacing between rows would be approximately 8 feet. Each 1 MW block could have exterior dimensions of approximately 420 feet by 711 feet. These blocks would be adjacent to each other or separated by all-weather roads. A 20-foot-wide all-weather road could be provided around the perimeter of each section for maintenance purposes. An inverter structure and transformer would be placed at the center of each 1 MW block. The prefabricated inverter structures could be approximately 14 feet by 12 feet and house the inverters and associated electrical equipment. The transformer would be located adjacent to the inverter housing. A 12-foot-wide all-weather road would be constructed to each inverter housing in each 1 MW block.

Electricity from each block could be transmitted by underground cables to collector buildings. Each collector building could be an 8- by 60-foot pre-fabricated building. An all weather road would be needed for each building for maintenance purposes. An approximate 5,000-square-foot administration and control building would also be constructed. Electricity from each collector building could be transmitted by either aboveground or underground cables to a new substation to be located on-site. This substation could require a maximum of 10 acres.

Temporary facilities would be required during construction and include construction trailers and parking areas. An estimated 40 to 50 acres would be required for staging construction materials. The staging area would be fenced for security and may include crushed rock surfacing. The staging areas would be located within the solar array footprint and could be relocated as construction commences within different areas.

Concrete would be required for PV panel frame ballasts when used as a construction technique. On-site concrete batch plants would be set up in the staging areas to produce these ballasts. Concrete from these plants could also be used to create foundations and pads for inverters, transformers, and substation equipment.

The installation of the solar power facilities and associated infrastructure, including transmission facilities and permanent access and maintenance roads, could result in the complete removal of vegetation. Native vegetation in the form of seeds, cuttings, and plants could be stockpiled during site clearance for the post-construction re-vegetation. Most areas where solar panels and other ancillary infrastructure are placed would not be re-vegetated. Measures to prevent the propagation and spreading of noxious weeds and other non-native vegetation would be taken during grading, construction, and operation of the facility.

The perimeter of the site would be secured with a chain link fence topped with barbed wire. All buildings would be secured with locks on the doors.

To reduce the impact of clearing and grading operations, BMPs would be used based on soil and surface conditions. Surface water drainage patterns could be altered on the site due to grading. However, runoff would be properly managed to avoid erosion or increased flooding in the project area. A site drainage management plan would be developed detailing an erosion control strategy using native plant species and drainage management structures and techniques.

C Operation and Maintenance

The PV panels, structures, and electrical distribution system would require minimal maintenance. Periodic maintenance activities may include washing of the PV panel surfaces. However, further study into the performance reduction would be required to establish cleaning intervals. Other periodic maintenance activities would include maintenance of the transformers. The majority of the site roads would be traveled infrequently and will be re-graded and maintained as needed.

Although PV technology does not utilize any water to produce electricity, the facility would require some water on an ongoing basis for cleaning the installed PV panels. It is anticipated that no more than 100 acre-feet per section (640 acres) of water would be needed per year for cleaning purposes and the actual amount required could be substantially less. Additionally, water would be necessary for grading and compaction at the site and for dust control during construction.

Vegetation on-site could be cut back mechanically to allow for installation and to prevent shading of the solar panels. Vegetative debris could be shredded and distributed in place. Native vegetation is expected to re-grow both between and under the rows of PV panels. Vegetation would be periodically re-cut over the life of the facility to prevent shading of the panels.

It is anticipated that each PV panel supplier would have a recycling program. Each supplier should provide for packaging and transportation of modules to their recycling center.

Wind Energy RFD

In June 2005, BLM filed the FPEIS on Wind Energy Development on BLM-administered lands in the Western United States (Wind Energy FPEIS). Those portions of the Wind Energy FPEIS that are applicable to the Planning Area are hereby incorporated by reference in accordance with 40 CFR 1502.21. The CDCA Plan adopted the BMPs from the Wind Energy Development FPEIS.

Chapter 3, Overview of Wind Energy Projects, in the Wind Energy FPEIS describes the activities likely to occur during each of the major phases associated with the development of a wind energy project: site testing and monitoring, construction, operation, and decommissioning, including applicable mitigation.

Appendix D, Wind Energy Technology Overview, in the Wind Energy FPEIS includes discussions of terminology, turbine design, existing commercial wind projects, and research and development a potential applicant could use in developing a plan of development for a ROW application in or adjacent to the Planning Area.

Camping Pad Construction RFD

Visitors who camp outside of a pad area due to limited available space often get stuck in sand, thereby causing a hazard to themselves and others. Also, due to the limited camping pad space, visitors tend to park close to the road, which can result in damage to the road shoulder, difficult enforcement of the parking rules, and a safety hazard to pedestrians.

Camping pad construction would typically include the following activities:

- Grading, watering, and compacting the subsurface material
- Moving sand on and adjacent to the project site
- Installing a geo-textile material
- Applying approximately 9 inches of aggregate base material

Each pad would consist of three layers: a compacted sand base using a grader and water spread by a water truck, installation of a geo-textile web material, and deposition of approximately 9 inches of compacted aggregate base brought in by dump truck and compacted using a grader and water spread by a water truck. All construction would be inspected by BLM engineering staff. Dust suppression materials would be applied during the construction phase and would follow Best Available Control Measures for Fugitive

Dust found in the most current ICAPCD's Rule 805. Construction would take approximately two months to complete.

Vault Toilet Construction RFD

During the recreation season, BLM contracts with a vendor to provide portable toilets within recreation areas that are not yet developed. In developing these recreation areas, the construction of permanent vault toilet units would reduce administrative time, cost for contracts, and would provide year-round facilities in the area. Overall, permanent vault toilets would reduce time, labor, and administrative costs over the life of the toilets. At full capacity, each toilet would safely store 30,000 gallons of refuse. With pumping occurring three to four times a year, 90,000 to 120,000 gallons of refuse would be contained instead of deposited in the dune environment. In comparison, each portable toilet (currently used) holds only 35 gallons, is pumped daily, and is used only during five weekends a season. Comparing the cost of the permanent toilets to the current portable toilet contract, the vault toilets would pay for themselves in 5 years. Construction of vault toilets would provide a healthier and more enjoyable experience for the visitor, encourage dispersed use to remote sites, and result in a reduction of illegal dumping of effluent material.

Vault toilet construction would include the following activities:

- A backhoe would be used to dig a hole (4.25 feet deep by 16 feet long by 13 feet wide) for each unit.
- A semi-tractor trailer would be used to deliver the toilets to the construction site.
- The 810 cubic feet of displaced sand would then be used to backfill around the toilets and build up the surrounding areas.
- All the sites would be properly contoured to achieve natural terrain feature and encourage natural revegetation.
- The toilets would be located on BLM-administered lands in the Planning Area.

All sites would be constructed adjacent to existing roads and located in heavily impacted areas already used for camping. Toilets would be placed so that native vegetation would not be harmed during construction activities. The toilets along Wash Road would be located on high ground and away from washes to ensure that the toilets would not be flooded.

Road Construction RFD

The BLM would consider new access road construction in the Planning Area when needed (and as funding becomes available) to facilitate greater and improved access. New roads would provide street-legal vehicle access for camping associated with OHV recreation to previously inaccessible areas of the Planning Area. New access roads could traverse hard pan desert, active sand dunes, ephemeral streams (dry washes), and could be constructed in phases to address funding needs. Major access routes would be two-lane roads (32 feet wide, including the shoulders).

The BLM would use natural material from a local gravel pit approximately two miles from the eastern edge of the Planning Area, north of SR-78. Spoils from project sites would be deposited no farther than 100 feet away from the new road edge and either downstream or downwind whenever possible. Spoils would be evenly distributed to blend in with the natural environment, would not significantly alter ephemeral stream course, and would not pose a significant safety risk to OHV recreationalists in the area.

New road construction would consist of the following:

- Use graders, water tanker trucks, dump trucks, rollers, dozers, loaders, and other administrative vehicles.
- Grade and compact a new road base in the existing natural material base.
- Excavate soft sand at dry sand wash crossings and refill with Class II road base material.
- Lay a geo-textile fabric over natural material then import, distribute, water, level, and compact a minimum of 9 inches of road base material over the geo-textile material.
- Apply dust suppression materials during construction phase and would follow Best Available Control measures found in the most current ICAPCD's Rule 805.

After construction has been completed, BLM would need to perform periodic maintenance of access roads. Maintenance could include rebuilding damaged road sections, moving windblown sand, watering, and compacting. Levels of maintenance would be dependent upon the level of development on the road. Generally, less development would require more maintenance, while higher levels of development would require less maintenance.

Signs would also be installed along the road shoulder, indicating a speed limit to increase safety and reduce dust. Additional signs could be placed intermittently to advise visitors of other rules, regulations, and information in the Planning Area. Signs would consist of single fiberglass posts or metal C-channel posts, which are pounded into the ground by hand or hydraulic hammer. An informational kiosk would be installed at initial access points. The kiosk would require two cement foundations, 2 feet in diameter and 3 feet deep. Information about the dunes, including safety and resource conservation information, would be posted at the kiosk.

Separate fee collection areas may also be needed. A fee collection facility would be in the form of additional hard-packed pull-through areas (up to five lanes). The proposed fee collection facility would also facilitate safe ingress and egress for visitors paying fees, as well as the staff involved in fee collection. In order to control the flow of traffic, BLM could install traffic control devices along private property boundaries.

In addition, trash collection facilities in the form of additional hard-packed, pull-through areas adjacent to new roads could be constructed. Each trash collection facility would be constructed to facilitate safe ingress and egress for visitors disposing of trash.

In future years, and when funding becomes available, BLM would like to pave access roads to reduce maintenance and improve air quality. Paving could reduce ephemeral stream erosion during flash flood events and assist Imperial County in meeting the objectives set forth in the County's Dust Plan.

Concessions RFD

Concession leases authorize the operation of recreation-oriented services and facilities by the private sector on BLM-administered lands and in support of BLM recreation programs. Concessionaires are authorized through a concession lease, which is administered on a regular basis and which requires the concessionaire to pay fees in exchange for the opportunity to carry out business activities. For example, many services in National Parks are provided by concessionaires rather than by individual vendors, and many of the management activities are often provided by the concessionaire rather than by the managing agency.

The BLM has entered into a contract agreement with a private entity to manage the fee collection program. The vendor supplies and maintains the automated pay stations, collects the funds, and periodically pays the BLM a percentage of the revenue on a sliding scale based on the gross revenue. The contract for fee collection is a small step toward a concession program, under which a private contractor would manage some of the programs within the Planning Area, or provide goods or services under a contract with the BLM.

The BLM is exploring the possibility of a more active concession program. Various aspects of management for portions of the entire project may be suitable for private or other government entity management. However, law enforcement for the Planning Area would remain with the BLM. Under this scenario, the concessionaire would provide staff and other resources at cost and profit basis, or for a percentage of the gross revenues. Some of the most common concessionaire activities would include: establishing controlled access points, development at main entry points, and management of concession or vendor services.

All concessionaire proposed developments would require BLM approval of a POD prior to any surface-disturbing activities could occur.

A Controlled Access Points

Access points would be limited to five or six locations: Mammoth Wash, Gecko Road, Wash Road, Dune Buggy Flats, Buttercup, and possibly Ogilby Road. Main access road construction and maintenance would occur as described in the Road Construction RFD described in this appendix. Each access point would require a permanent fee collection facility. Fee collection facilities would be in the form of additional hard-packed pull-through areas (up to five lanes). The proposed fee collection facility would also facilitate safe ingress and egress for visitors paying fees, as well as the staff involved in fee collection. In order to control the flow of traffic, the concessionaire could install traffic control devices along private property boundaries. In addition to fee collections, a reservation system could be developed leading to pre-assignment of campsites.

B Developments at Main Entry Points

Development at entry points would likely increase over time. Basic development would likely consist of concessionaire office facilities and concession or vendor service facilities. Office facilities could include construction of a modular building or placement of an office trailer for concessionaire staff. Concession or vendor service facilities could include, but are not limited to: stores, vehicle repair facilities, an RV dump station, internet access using Wi-Fi, and retail sales structures. Each of these facilities would require development of some basic infrastructure such as water, sewer, electricity, staff parking, and possibly overnight facilities for staff. Wi-Fi internet access would require a tower.

C Management of Concession or Vendor Services

Concession and vendor services requiring management include but are not limited to: fee collection, trash collection, servicing of vault toilets, road and camping pad maintenance (see Road Construction and Camping Pad RFDs described in this appendix), emergency services, and retail vending. Management would require appropriate staffing and procurement of needed services.