

## EXECUTIVE SUMMARY

This final environmental impact statement (final EIS) evaluates the environmental effects associated with licensing the proposed 1,300-megawatt (MW) Eagle Mountain Pumped Storage Hydroelectric Project (Eagle Mountain Project or project). The proposed project would be located on the site of the largely inactive Eagle Mountain mine, in Riverside County, California, near the town of Desert Center. The project would not be located on a perennial river and, therefore, would operate as a closed system.<sup>7</sup> The project would supply system peaking capacity and transmission regulating benefits to the regional electrical grid. Under current land ownership, the proposed project would occupy 675.63 acres of federal lands managed by the U.S. Department of Interior, Bureau of Land Management (BLM), 467 of state acres of land administered by the California State Lands Commission, and about 1,545.63 acres of private lands owned by Kaiser Eagle Mountain, LLC.<sup>8</sup>

### **Proposed Action**

The project as proposed by Eagle Crest Energy (Eagle Crest or applicant) would use reservoirs created from two largely inactive mining pits near the town of Desert Center, California. The project would consist of: (1) an upper and lower reservoir with surface areas of 191 and 163 acres, respectively;<sup>9</sup> (2) an underground powerhouse with four reversible pump-turbine units each rated at 325 MW for a total generating capacity of 1,300 MW; (3) a 13.5-mile-long transmission line; and (4) groundwater supply facilities. Project facilities are described in more detail in section 2.2.1. The project would operate as a pumped storage facility that would pump water from the lower reservoir to the upper reservoir during periods of low energy demand and discharge water to the lower reservoir to generate electricity during periods of high demand.

Eagle Crest proposes the following measures for the protection and enhancement of environmental resources during project construction and/or operation: (1) implement the Phase 1 Pre-Design Site Investigation Plan since access to the privately owned project site is currently limited; (2) implement the Erosion and Sediment Control Plan; (3) develop and implement a water management plan; (4) develop a network of groundwater monitoring wells; (5) develop measures to prevent effects such as subsidence (from increased groundwater levels) on the operation of the Metropolitan

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<sup>7</sup> For the purposes of this project, the system is defined as closed because it would not have a surface water hydrological connection other than occasional stream flow from the ephemeral Eagle Creek.

<sup>8</sup> The actual amount of federal land the project would occupy will depend on pending litigation associated with a land exchange that occurred in 1999.

<sup>9</sup> As part of the project's construction, Eagle Crest would need to install two saddle dams at the upper reservoir/mine site.

Water District of Southern California's Colorado River Aqueduct (Colorado River Aqueduct);<sup>10</sup> (6) install a reverse osmosis desalination facility to maintain water quality in the reservoirs at the level of the source water; (7) implement the Invasive Species Monitoring and Control Plan; (8) implement the Revegetation Plan for disturbed areas during construction; (9) construct fencing for security and to exclude larger terrestrial wildlife from entering project areas; (10) implement the Desert Tortoise Clearance and Relocation/Translocation Plan prior to and during construction; (11) implement the Predator Monitoring and Control Plan; (12) design, install, and maintain facility lighting to limit light pollution; (13) acquire land to mitigate for the desert tortoise habitat that may be disturbed by the project; (14) maintain recreational access to areas near the proposed project during construction; (15) implement the Historic Properties Management Plan (HPMP) filed March 4, 2011; and (16) limit the effects of project construction and operation on air quality and noise. These and other proposed measures are described in detail in section 2.2.4.

### **Alternatives Considered**

This final EIS analyzes the effects of proposed project construction and operation and recommends conditions for any license that may be issued for the project. In addition to the applicant's proposal, we consider two alternatives: (1) the applicant's proposal with staff modifications (staff alternative); and (2) no action—whereby the project would not be constructed. In addition, we analyzed three transmission line routes: the applicant's proposed transmission line route, the State Water Resources Control Board's (State Water Board's) preferred alternative route, and a transmission route endorsed by the U.S. Department of the Interior (Interior). As a result, the State Water Board's preferred alternative transmission line route is included in the staff alternative.

Under Eagle Crest's proposal with staff modifications, the project would operate as proposed by Eagle Crest but would also include the following expanded or additional measures: (1) construct the project transmission line along the State Water Board's preferred alternative transmission line route, rather than the applicant's proposed route; (2) connect the project to the grid by terminating the transmission line at the State Water Board's preferred substation location south of Interstate 10 about 6 miles east of Eagle Crest's proposed substation location; (3) modify the stream channel along the ephemeral Eagle Creek; (4) monitor water quality and levels of the reservoirs, brine ponds, and leakage during project operation; (5) prepare a groundwater hydrologic budget and reports; (6) conduct a performance pumping test of the final seepage recovery system prior to reservoir filling to ensure that local control of the groundwater near the proposed reservoirs is possible; (7) decrease the filling rates of the reservoirs during the initial

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<sup>10</sup> Subsidence is the downward settling of the land surface caused by a lowering of the water table (such as by extensive water withdrawal) or an increase in the water table that causes the consolidation and settling of the soils.

filling period if drawdown in groundwater levels exceed the Maximum Allowable Changes threshold;<sup>11</sup> (8) prevent groundwater levels from encroaching within 5 feet of the bottom of the landfill liners; (9) limit subsidence to less than 0.125 foot near the Colorado River Aqueduct; (10) modify the proposed Invasive Species Monitoring and Control Plan to include criteria for success and develop additional environmental measures if initial efforts are not successful; (11) install fencing to exclude most small mammals and reptiles from project reservoirs; (12) prevent the establishment of woody riparian vegetation along project reservoirs; (13) provide 1-mile buffers around active raptor nests; (14) initiate surveys for nesting migratory birds in January before beginning and during each year of construction; (15) monitor use of drinking water access areas for wildlife and consult with BLM, U.S. Department of the Interior, Fish and Wildlife Service (FWS), and California Department of Fish and Game (California DFG) to develop additional water sources if proposed water access sites do not benefit bighorn sheep; (16) consult with BLM, FWS, and California DFG to develop and implement a burrowing owl relocation program, if pre-construction surveys detect active owl burrows in the disturbance zones, (17) modify the proposed avian protection plan to include measures to reduce avian collisions with the transmission line and monitor avian injury and mortality associated with the line; (18) survey for the spadefoot toad (a BLM sensitive species and a state of California species of special concern) before construction and, if found, implement measures to avoid disturbance to this species; (19) implement the Predator Monitoring and Control Plan included in the Federal Energy Regulatory Commission's (Commission's) Biological Assessment issued on April 21, 2011; and (20) develop plans, in consultation with resource agencies for installing the water pipeline and, where on private lands, in the most desirable location for the landowner, to the extent possible. The recommended staff modifications include, or are based in part on, recommendations made by the federal and state resource agencies that have an interest in the resources that may be affected by the project's construction and operation.

### **Public Involvement and Areas of Concern**

Before filing its license application, Eagle Crest conducted a pre-filing consultation process under the traditional licensing process. The intent of the Commission's pre-filing process is to initiate public involvement early in the project planning process and encourages citizens, governmental entities, tribes, and other interested parties to identify and resolve issues before an application is formally filed with the Commission.

After the application was filed, we conducted scoping to determine which issues and alternatives should be addressed. On December 17, 2008, we distributed Scoping Document 1 (SD1) to interested parties, soliciting comments, recommendations, and

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<sup>11</sup> The Maximum Allowable Change for ground water levels reductions are identified in table 12.

information about the project. We held public scoping meetings in Palm Desert, California, on January 15 and 16, 2009. In SD1, we requested clarification of preliminary issues concerning the Eagle Mountain Project and identification of any new issues that needed to be addressed in the EIS. Based on written comments filed with the Commission, we issued a revised scoping document (SD2) on June 5, 2009. On January 11, 2010, we requested conditions and recommendations from state and federal resource agencies in response to the Ready for Environmental Analysis notice.

On December 23, 2010, we issued the draft EIS for licensing the proposed project. We conducted two public meetings regarding our draft EIS on February 3, 2011, in Palm Desert, California. Comments on the draft EIS were due by February 28, 2011, and we received comments from: the State Water Board; Center for Biological Diversity; U.S. Environmental Protection Agency; Jonny Coon; the San Geronio Chapter of the Sierra Club; Metropolitan Water District; Philip R. Hu; JoAnn and Warren Dean; Advisory Council on Historic Preservation; Brenden Hughes; Eagle Crest; Kaiser Eagle Mountain, LLC; Mine Reclamation, LLC; Citizens for Chuckwalla Valley; U.S. Department of the Interior, National Park Service (Park Service); and County Sanitation District No. 2 of Los Angeles County.

The primary environmental issues associated with licensing the project are the effects of the proposed project's construction and operation on groundwater, water quality, and terrestrial species, including several state-sensitive bat species, the BLM sensitive desert bighorn sheep, and the threatened desert tortoise.

## **Project Effects**

### *Geology and Soils*

Constructing the project would require the movement of about 3 million cubic yards of material for the construction of the two saddle dams and liners for the proposed reservoirs, additional surface excavation for the proposed water lines, and infrastructure associated with the proposed transmission line and substation. Under the applicant's proposal, erosion and sediment transport would be controlled during construction through implementation of the proposed Erosion and Sediment Control Plan.

### *Water Resources*

Groundwater levels would be affected by withdrawals from a series of proposed wells in the Chuckwalla groundwater basin to fill the reservoirs and replace water lost to evaporation. After the reservoirs are filled, high evaporation rates could degrade the water quality in the reservoirs and seepage from the reservoirs could affect nearby groundwater quality. Changes to the current surface water flow patterns during the very rare rainfall events would be affected by construction of the proposed project. The reservoirs and other proposed infrastructure are designed to withstand the probable maximum flood inflow from Eagle Creek and smaller watersheds that would occasionally reach the proposed reservoirs. Under the applicant's proposal, groundwater withdrawal

would be limited to less than the historical levels associated with agricultural irrigation. Monitoring wells and other methods would determine the amount of seepage from the proposed reservoirs, the water level change due to pumping, water quality effects due to project operations, and the potential for subsidence near existing key infrastructure, including the Colorado River Aqueduct. A proposed reverse osmosis system would remove salts and metals from the reservoirs to help maintain the water quality of the reservoirs and counteract degradation associated with evaporation.

Under the staff alternative, additional monitoring and testing of the reservoirs, brine ponds, and wells would occur, and our modifications would provide more protection, warning, opportunities, and measures to rectify potential negative effects that could occur during construction and operation of the proposed project, including additional measures to protect the groundwater levels within the area, protect groundwater quality, and perform stream channel modifications along Eagle Creek.

### *Terrestrial Resources*

Construction of the proposed project would disturb lands within the footprint of the project facilities, including the reservoirs, access roads, substation, transmission lines, and other areas. The disturbance associated with filling the project reservoirs and creating a new source of drinking water for wildlife has the potential to affect bats that roost in rock crevices within the existing mine craters and alter migration movement for bighorn sheep. Under Eagle Crest's proposal, Interior's preferred alternative, and the staff alternative, construction of the proposed transmission line has the potential to disturb desert vegetation and associated wildlife habitat that is slow to regenerate within the desert ecosystem. This disturbance would be associated with grading of access roads, storage areas, and pull sites associated with construction of the proposed transmission line and water supply pipeline. Under the applicant's proposal and the staff alternative, site-specific mitigation, monitoring, and compliance programs would be implemented during project construction and operation to limit invasive species colonization and environmental effects on special-status plant and animal species, but these measures could also be applied to Interior's preferred route. Specifically, the applicant would implement measures in its Worker Environmental Awareness Program (WEAP), Revegetation Plan, and Invasive Species Monitoring and Control Plan to limit potential effects on terrestrial resources. Security fencing is proposed to limit access to the majority of the central project area by bighorn sheep, deer, coyotes, foxes, and badgers. The fencing also is designed to provide safe access to the new source of drinking water for wildlife. Eagle Crest also proposes to develop and implement a transmission line design plan, based on industry and regulatory standards, to protect raptors from electrocution hazards.

Under the staff alternative, the proposed Invasive Species Monitoring and Control Plan would be modified to include criteria for success, additional monitoring, and the development of environmental measures if initial efforts do not prove successful. Additionally, the reservoirs, water seepage areas, and areas disturbed during project

maintenance would be monitored for invasive plants. The design of the exclusion fences around the reservoirs would be modified to also exclude small mammals and reptiles from the project reservoirs. The proposed Revegetation Plan would be modified to include use of certified weed-free materials and increased irrigation for transplanted plants. The transmission line design plan would also be modified to include avian protection measures that, in addition to the applicant's proposed measures to prevent electrocutions, would also include measures to reduce potential for avian collisions with the transmission line and a protocol to monitor and report avian injury and mortality associated with the transmission line. Pre-construction surveys for the spadefoot toad would occur in all proposed construction areas not previously surveyed, and if this species is found, measures to avoid disturbance would be followed.

### *Threatened and Endangered Species*

Two federally listed species have the potential to occur in the project area: the endangered Coachella Valley milkvetch (*Astragalus lentiginosus* var. *coachellae*) and the threatened desert tortoise (*Gopherus agassizii*), but only the desert tortoise has been observed in the project area. Construction of the proposed transmission line and water pipeline, as well as components of the central project area, would occur within potential desert tortoise habitat. The operation of heavy machinery and grading in this area may adversely affect desert tortoise through vehicular collisions, burrow collapse, and vegetation removal. In addition, following construction, the transmission line could provide nesting and perching habitat for ravens and gulls and water access for coyotes and feral dogs, all potential desert tortoise predators. As a result, Eagle Crest would implement measures in its WEAP, Desert Tortoise Clearance and Relocation/Translocation Plan and Predator Monitoring and Control Plan to protect the threatened desert tortoise during construction and operation of the project. Additionally, Eagle Crest would purchase and protect land to compensate for desert tortoise habitat that would be disturbed during construction of the proposed project or lost as a result of the project.

Under the staff alternative, Eagle Crest's proposed plan to monitor and control desert tortoise predators would be modified to include specific survey methods for coyotes and wild dogs and would include mitigation and control measures for these additional species. The staff-modified Predator Monitoring and Control Plan would also include more frequent surveys during the early years of the project.

Further, as discussed below, the staff alternative transmission line route would reduce effects within the Chuckwalla Critical Habitat Unit for desert tortoise by up to 18.6 acres, as compared to the alternative routes considered.

### *Recreation, Land Use, and Aesthetics*

Construction and operation of the project could adversely affect recreation, land use, and aesthetics in the project area through increased nighttime sky lighting, limits to some access routes, and inundation of some of the remaining but currently non-economical ore reserves. Recreation resources in the region are primarily provided and

managed by the Park Service and BLM. Much of the land in the proposed project area is public land managed by BLM or land associated with the Eagle Mountain mine. Under the applicant's proposal, construction schedules would be coordinated with BLM for any temporary road and access closures. A directional lighting plan and other measures, including a night sky monitoring program, is proposed to limit the effects of the project lighting. Coordination of proposed project construction and operation with the possible landfill construction and operation is planned. During construction, visual effects would be limited and mitigated by these proposed measures.

### *Transmission Line*

Eagle Crest's proposed 13.5-mile-long transmission line would parallel the existing Eagle Mountain Road for about 4.5 miles before crossing the Chuckwalla Valley in a southeasterly direction to connect to the proposed interconnection collector substation on the western edge of Desert Center. Eagle Crest's proposed route would also result in the disturbance of about 19 acres of the Chuckwalla Critical Habitat Unit for desert tortoise.

In its draft environmental impact report for the Eagle Mountain Project, the State Water Board identified its preferred substation location and preferred alternative transmission line route. The State Water Board's preferred substation location would be immediately south of Interstate 10 and about 6 miles east of the applicant's proposed substation. The State Water Board's preferred alternative transmission line route would diverge from the applicant's proposed transmission line route after crossing the Colorado River Aqueduct. The State Water Board's preferred alternative transmission line route would then parallel the existing 160-kilovolt Southern California Edison transmission line for about 10.5 miles going southeast to a point just north of the proposed substation, and then it would travel south about 2 miles to its preferred substation location. This route would result in the disturbance of about 0.4 acre of the Chuckwalla Critical Habitat Unit for desert tortoise.

In comments filed on the draft EIS (February 28, 2011), Interior clarified that its preferred alternative transmission line route is along Kaiser Road. This alternative route would follow the State Water Board's preferred alternative transmission line route to Kaiser Road, turn south and parallel Kaiser Road for about 5.2 miles, and then turn east and travel about 0.9 mile, crossing over State Route 177. From here, this transmission line route would travel southeast for 0.8 mile and east for 3.7 miles, then turn south about 2 miles to the substation. In total, this alternative route would be 18.6 miles long and result in the disturbance of about 12.4 acres of the Chuckwalla Critical Habitat Unit for desert tortoise.

Under the staff alternative, the transmission line would be designed and constructed following the State Water Board's preferred alternative transmission line route to the State Water Board's preferred substation location that would be south of Interstate 10 and about 6 miles east of Desert Center. When compared to the proposed

transmission line route, the staff alternative transmission line route would be slightly longer; however, it would be largely co-located with an existing transmission line corridor outside of the Chuckwalla Critical Habitat Unit for desert tortoise, affecting 0.4 acre and therefore minimizing effects on the threatened desert tortoise and its habitat.

### *Cultural Resources*

In addition to traditional use by Native Americans, the project area also was used historically for mineral exploration, military training during World War II, and large-scale iron ore extraction. Construction of the proposed project could affect cultural resources during excavation associated with the proposed water pipeline, construction of the proposed substation and transmission line, and construction of the proposed reservoirs in the largely inactive mining pits and the associated infrastructure.

Under Eagle Crest's proposal, cultural resources would be protected under provisions specified in its revised HPMP filed with the Commission on March 4, 2011. The Programmatic Agreement incorporates the revised HPMP.

### *Socioeconomics*

No residences or businesses would be displaced due to the construction and operation of the project. Operation of Eagle Mountain mine, which was, by far, the largest employer in the area, ended in 1983. Under Eagle Crest's proposal, project construction would provide about 100 jobs during the peak construction period and would provide tax revenues to county and local governments. Project operation would provide about 30 jobs, as well as substantial property tax payments.

### *Air Quality and Noise*

Construction of the proposed project would include emissions from heavy equipment and dust and noise production. Under Eagle Crest's proposal, air quality measures, including means to limit dust production and emissions from construction-related vehicles and equipment, would be implemented. Noise levels are proposed to be limited by compliance with applicable noise ordinances and equipping construction machinery with noise reduction measures.

### **Conclusions**

Based on our analysis, we recommend licensing the project as proposed by Eagle Crest with some staff modifications and additional measures, as described above under *Alternatives Considered*.

In section 4.2 of the final EIS, we compare the total project cost to the cost of obtaining power from a likely alternative source of power in the region, for each of the alternatives identified above. During the first year of operation, under the applicant's proposal, the project would produce power at a cost that is \$134,052,480, or about \$31.12/megawatt-hour (MWh), less than the cost of alternative power. Under the staff



alternative, the project would produce power at a cost that is \$133,131,500, or about \$30.90/MWh, less than the cost of alternative power. Under the no-action alternative, the project would not be constructed and would provide no power.

We chose the staff alternative as the preferred alternative because: (1) the project would provide a dependable source of electrical energy for the region (4,308,000 MWh annually); (2) the 1,300 MW of electric capacity would come from a renewable resource that would not contribute to atmospheric pollution; (3) pumped storage projects store power during off-peak periods that can be provided rapidly during on-peak periods and could provide a valuable addition to the stability of the regional electrical grid; and (4) the recommended environmental measures proposed by Eagle Crest, as modified by staff, would adequately protect and enhance environmental resources affected by the project. The overall benefits of the staff alternative would be worth the additional costs of the proposed and recommended environmental measures.