

SAN DIEGO GAS & ELECTRIC COMPANY

SUNRISE POWERLINK TRANSMISSION LINE PROJECT

RAVEN CONTROL PLAN

**PER MITIGATION MEASURE B-11A:
PREPARE AND IMPLEMENT A RAVEN CONTROL PLAN**

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Figure 1. Proposed Sunrise Powerlink Transmission Line

Figure 2. Flat-tail Horned Lizard (FTHL) Distribution and Management Areas in Relation to the Proposed Sunrise Powerlink and Existing Southwest Powerlink Transmission Lines

Table 1. Perching Deterrent Placement on the Proposed Sunrise Powerlink Transmission Line

ATTACHMENT A. _Perch Deterrent Sketch

ATTACHMENT B. _Common Raven and Raptor Nest Information

ATTACHMENT C. _Nest Reporting Form

ATTACHMENT D. _Roost Reporting Form

1.0 INTRODUCTION

1.1 Project Overview

The Sunrise Powerlink Transmission Line Project includes the construction of an approximately 120-mile-long 230 kilovolt (kV)/500 kV transmission line between the existing Imperial Valley Substation in southwestern Imperial County westward over the southern foot of the Peninsular Ranges to the existing Sycamore Canyon Substation in west-central San Diego County, California, and other system modifications to reliably operate the new lines. The Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS) evaluating the Project was issued by the California Public Utilities Commission (CPUC) and the Bureau of Land Management (BLM) in October 2008. Following that issuance, the CPUC and the BLM approved the Environmentally Superior Southern Route (ESSR), as identified in the Final EIR/EIS, for the Project in December 2008 and January 2009, respectively. In the area of concern for this Raven Control Plan, the proposed 500 kV transmission line will parallel the existing Southwest Powerlink, a 500 kV line energized in 1984. The Project will be approximately 400 feet from the existing Southwest Powerlink (Figure 1).

The Project EIR/EIS contains Mitigation Measure B-11a that requires the development and implementation of a raven control plan to reduce the risk of raven predation on the flat-tailed horned lizard (*Phrynosoma mcallii*) (FTHL).

B-11a: Prepare and implement a Raven Control Plan. *The Applicant shall prepare and implement a Raven Control Plan where it occurs in FTHL habitat inside and outside FTHL MAs. The raven control plan shall include the use of raven perching/nesting deterrents (such as those manufactured by Prommel Enterprises, Inc. [www.ZENAdesign.com], Mission Environmental [www.missionenviro.co.za], or Kaddas Enterprises, Inc. [www.kaddas.com] and/or shall describe the procedure for obtaining a permit from the USFWS Law Enforcement Division to legally remove ravens. The plan shall identify the purpose of conducting raven control; provide training in how to identify raven nests and how to determine whether a nest belongs to a raven or a raptor species; describe the seasonal limitations on disturbing nesting raptors; and describe procedures for documenting the activities on an annual basis. The Applicant shall obtain approval of this plan from the USFWS prior to the start of construction. The Applicant shall work with the USFWS until approval of a plan is obtained.*

The FTHL is distributed at the east end of the Sunrise Powerlink transmission line, east of Milepost (MP) 23 (see Figures 1 and 2). The Bureau of Land Management's Flat-Tailed Horned Lizard Management Area is located east of Sunrise Powerlink MP 7 (see Figure 2). FTHL habitat exists in areas of scattered sparse vegetation and fine windblown sand in the lower elevations (mostly below 820 feet in elevation, see CaliforniaHerps.com 2010).

According to Foreman (1997) and Duncan et al. (1994), the common raven (*Corvus corax*) is one of many predators of the FTHL and relatively high densities of ravens (and

other predators) may result in elevated predation on the FTHL. There is a concern that the transmission line towers associated with the Project could contribute to an increase in the number of ravens by providing increased nesting, roosting or perching opportunities on the newly constructed towers (Knight and Kawashima 1993). From MP 0 to MP 7 the FTHL Management Area currently includes 22 Southwest Powerlink 500 kV transmission towers. Sunrise will add 22 towers to this area. From MP 7 to MP 23, where suitable FTHL habitat is known, there are 49 existing towers for the Southwest Powerlink. Sunrise will add 53 towers to this area, which includes one tower located just west and outside suitable habitat. Thus, the total number of new towers proposed within and immediately adjacent to suitable FTHL habitat is 75.

Other human-caused changes related to power line construction could also benefit ravens by increasing the availability of both food and water to ravens. Therefore, this Raven Control Plan was developed to minimize all such factors that could benefit ravens.

1.2 Plan Objectives

The objective of this plan is to enhance flat-tailed horned lizard survival by reducing nesting, perching and roosting opportunities for the common raven on the Project transmission line towers and reducing human-provided subsidies of food and water within the Project area.

2.0 RAVEN CONTROL PLAN

2.1 Perching and Nesting Deterrents

Mitigation measure B-11a calls for the use of perching/nesting deterrents in order to minimize the impact of potential perching/nesting of common ravens on the FTHL, given that transmission structures, including towers, may contribute to increased nesting activity of ravens (APLIC 2006). As indicated in mitigation measure B-11a, there are several perching/nesting deterrents on the market, including those manufactured by Prommel Enterprises, Inc., Mission Environmental, and Kaddas Enterprises, Inc. SDG&E has identified the Prommel Enterprises Zena Perch Preventer as its preferred perching/nesting deterrent for the Project. Zena Perch Preventers are cone-shaped devices (Zena cones) that are made from UV protected proprietary high-density long-life black polyethylene.

SDG&E will install deterrents on every other tower from MP 0 to MP23, Thus, deterrents will be installed on 37 towers as shown on Table 1. Steenhof et al. (1993) found that 98 percent of the raven nests on a 500 kV line in Oregon and Idaho were located on the uppermost portions of towers. As such, the perching/nesting deterrents will be installed along the top rails of the bridges on the uppermost portions of the towers (see Attachment A).

SDG&E will monitor the results of the use of the deterrents, as described in Section 3 below. Additionally, SDG&E recognizes that there is ongoing research in the use of perching/nesting deterrents. SDG&E will monitor these studies periodically.

Table 1. Perching Deterrent Placement on the Proposed Sunrise Powerlink Transmission Line

| MP | Tower No. | Deterrent* | MP | Tower No. | Deterrent | MP | Tower No. | Deterrent |
|----|-----------|------------|----|-----------|-----------|----|-----------|-----------|
| 0 | EP363-1 | --- | | EP338 | Yes | | EP313 | --- |
| | EP-362-1 | Yes | | EP337 | --- | 16 | EP312 | Yes |
| | EP361 | --- | 9 | EP336 | Yes | | EP311-1 | -- |
| 1 | EP360 | Yes | | EP335 | --- | | EP310 | Yes |
| | EP359 | --- | | EP334 | Yes | | EP309 | --- |
| | EP358 | Yes | 10 | EP333 | --- | 17 | EP308 | Yes |
| 2 | EP357 | --- | | EP332 | Yes | | EP307-1 | --- |
| | EP356 | Yes | | EP331 | --- | | EP306-1 | Yes |
| | EP355 | --- | | EP330-1 | Yes | 18 | EP305-3 | --- |
| 3 | EP354 | Yes | 11 | EP329-1 | --- | | EP304-2 | Yes |
| | EP353 | --- | | EP328-1 | Yes | | EP303-2 | --- |
| | EP352 | Yes | | EP327 | --- | 19 | EP302-1 | Yes |
| 4 | EP351 | --- | 12 | EP326 | Yes | | EP301 | --- |
| | EP350 | Yes | | EP325-2 | --- | | EP300-1 | Yes |
| | EP349 | --- | | EP324 | Yes | 20 | EP299 | --- |
| 5 | EP348 | Yes | 13 | EP323-1 | --- | | EP298 | Yes |
| | EP347 | --- | | EP322-1 | Yes | | EP297 | --- |
| | EP346 | Yes | | EP321-1 | --- | 21 | EP296 | Yes |
| 6 | EP345 | --- | 14 | EP320-1 | Yes | | EP295 | --- |
| | EP344 | Yes | | EP319 | --- | | EP294 | Yes |
| | EP343 | --- | | EP318-1 | Yes | | EP293 | --- |
| 7 | EP342 | Yes | | EP317 | --- | 22 | EP292-1 | Yes |
| | EP341 | --- | 15 | EP316-2 | Yes | | EP291-1 | --- |
| | EP340 | Yes | | EP315-1 | --- | | EP290 | Yes |
| 8 | EP339 | --- | | EP314 | Yes | 23 | EP281 | --- |

**Perching deterrents will be installed on every other tower. The deterrents will be Zena Perch Preventers, which are cone-shaped devices (Zena cones) made by Prommel Enterprises, Inc.*

2.2 Raven Awareness Training Program

All construction and operation and maintenance personnel will receive training in the identification of common raven nests as well as how to distinguish such nests from raptor (birds of prey) nests. A brochure (Attachment B) will be distributed to construction and operation and maintenance personnel to describe and show examples of raven nests as well as raptor nests, and to describe the seasonal limitations on disturbing nesting raptors, which is from December through June. The brochure directs the readers to contact either the biological monitor (during construction) or SDG&E's Environmental Services Natural Resources Group (during operation and maintenance) should they observe a nest on a transmission tower. Inactive raven nests on Sunrise Powerlink transmission line towers will be removed both inside and outside of flat-tailed horned lizard habitat to avoid operational or safety hazard conditions, as discussed in further detail below.

2.3 Food Source Reduction

Ravens may obtain food from a variety of anthropogenic sources, including dumpsters, uncovered garbage cans, plastic garbage bags and food left for pets (Boarman 2002). To minimize the potential for food scavenging by ravens, all construction related trash will be collected daily and disposed in raven-proof receptacles. All construction workers will be required to watch a safety and worker environmental awareness training video that addresses the need to contain food and garbage so that it is not accessible to ravens and other wildlife. Operation and maintenance personnel will follow SDG&E's standard operational protocols outlining general behavior for all field personnel, including no littering, no depositing or leaving any food or waste on rights-of-way or adjacent property, and no feeding of wildlife.

2.4 Surface Water Source Reduction

The primary use of water on the Project within FTHL habitat from MP 0 to MP 23 will be for dust suppression to meet strict air quality requirements. To limit the introduction of any freestanding water in FTHL habitat, water truck fill locations will be selected in areas that drain well, water truck fill locations will be moved frequently, and the soil around each fill location will be searched at the beginning of each work day to locate and cover any standing water with dirt or sand. If necessary, gravel will be laid down, or other temporary engineering solutions will be installed to ensure that water truck filling operations do not provide a source of water for ravens. Additionally, any water leaks from storage tanks or trucks will be immediately repaired. It is anticipated that the high rate of evaporation in the desert environment will also help reduce the potential for this temporary water subsidy.

2.5 Raven Nest Removal

Removal of inactive raven nests can reduce the number of active nests that are later built during nesting season. A raven nest removal program in FTHL habitat, including the management area, will be implemented along the Sunrise Powerlink transmission line. With the exception of eagle nests and nests of endangered species, the U.S. Fish and Wildlife Service (USFWS) provides SDG&E with verbal permission to remove inactive nests (those without eggs or young) where they present an operational or safety hazard to the electric transmission and distribution systems. SDG&E will review with the USFWS and develop a procedure for removing inactive raven nests on Sunrise Powerlink transmission line towers under these operational or safety hazard conditions, both inside and outside of flat-tailed horned lizard habitat.

SDG&E's proposed nest removal program includes:

1. Survey the Sunrise Powerlink transmission line and the Southwest Powerlink transmission line where it parallels the Sunrise Powerlink by slowly driving their common access road a minimum of five (5) times during the breeding season for ravens in desert regions (February – early June) to identify those towers with nests potentially used by ravens. Nests identified on the Southwest Powerlink transmission line towers will be recorded to provide a control for analysis of the effects of the Sunrise Powerlink on ravens. Ravens lay eggs from early March to at least early May, with some beginning mid February in the Anza-Borrego Desert and along the Mexican border (Unitt 2004). To avoid any impacts to FTHL during the survey for raven nests, the biologist will drive the access roads very slowly (no more than 10 miles per hour) to allow for detection of the lizards. The biologist will also be required to attend the BLM's 1-day workshop on tracking and finding FTHL. The common access road for both the Sunrise Powerlink and the Southwest Powerlink mostly parallels the transmission lines and is located from 50 feet to 850 feet from the transmission lines. Spur roads off of the access road that lead to each tower will also be driven or walked, as necessary, during the nest surveys. Binoculars and spotting scopes will be used to scan towers for nests during the surveys. Only that portion of Sunrise Powerlink traversing FTHL habitat (MP 0 to MP 23, from tower EP363-1 to EP281) and the corresponding adjacent Southwest Powerlink alignment (tower 313 to tower 242) would be surveyed.
2. Following each driving survey, a two person crew from SDG&E Transmission Construction & Maintenance (TCM) consisting of a patrolman and lineman would drive to and climb each of the Sunrise Powerlink towers identified as containing a potential nest during the driving survey. The TCM crew would be accompanied by a qualified raptor biologist, and the lineman, in consultation with the biologist, would make a determination as to whether the nest observed is a raven nest or the nest of some other raptor species. If it is determined to be a raven nest, and there are no young or eggs on the nest, then the nest would be removed. If there are eggs or young on the nest, then the nest or its contents may not be removed unless a depredation permit is obtained from the USFWS.

As noted, SDG&E will have a qualified raptor biologist perform the driving survey of the transmission lines during the raven nesting season to determine the presence of nests. Any nest would be recorded by tower number, and this information would be provided to the BLM and USFWS so that efforts to potentially remove these ravens from the population could proceed. A report of findings would be submitted to BLM and USFWS annually.

2.6 Raven Roost Identification and Discouragement

Identifying and discouraging ravens from roosting can reduce the number and effectiveness of any roosts and foraging patterns. There is evidence that communal raven roosts act as information centers whereby birds that have foraged unsuccessfully can learn the whereabouts of food sources by following successful foragers the next morning from the roost or that the roosts function as simple assembly points to spatially concentrate foragers at the start of each day (recruitment centers) (Wright, et. al, 2003). A roost identification and discouragement program for roost abandonment in FTHL habitat, including the management area, will be implemented along the Sunrise Powerlink. Roosts will also be identified on the Southwest Powerlink transmission line where it parallels the route in FTHL habitat to compare roosting behavior between the two lines. SDG&E will review with the USFWS and develop a procedure to identify the best method to cause ravens to abandon a roost, (e.g., hazing techniques that use visual and/or auditory devices to scare birds and reduce the attractiveness of an area), both inside and outside of flat-tailed horned lizard habitat.

SDG&E's proposed roost identification and discouragement program includes:

1. Survey the Sunrise Powerlink and the Southwest Powerlink transmission line where it parallels Sunrise Powerlink in late evening by slowly driving their common access road twice a year to identify those towers and spans with communal raven roosts in FTHL habitat. The surveys will be conducted once late in the breeding season (e.g., May) and once in the fall (e.g., October) To avoid any impacts to FTHL during the survey for raven nests, the biologist will drive the access roads very slowly (no more than 10 miles per hour) to allow for detection of the lizards. The biologist will also be required to attend the BLM's 1-day workshop on tracking and finding FTHL. The common access road for both the Sunrise Powerlink and Southwest Powerlink mostly parallels the transmission lines and is located from 50 feet to 850 feet from the transmission lines. If necessary, binoculars will be used to scan towers for roosts during the surveys. Only that portion of Sunrise Powerlink traversing FTHL habitat (MP 0 to MP 23, from tower EP363-1 to EP281) and the corresponding adjacent Southwest Powerlink alignment (tower 313 to tower 242) would be surveyed.
2. Employ techniques, as developed in consultation with the BLM and USFWS, to discourage ravens from roosting and to cause ravens to abandon their roost.

As noted, SDG&E will have a qualified raptor biologist survey the transmission lines once late in the breeding season and once in the fall to determine the presence of roosts. Any roost would be recorded by tower number, and this information would be provided to the BLM and USFWS so that efforts to potentially discourage roosting behavior could proceed. A report of findings would be submitted to BLM and USFWS annually.

2.7 Adaptive Management

Ravens are highly intelligent and opportunistic, so any plan to control their nesting activities needs to be flexible to adapt to their resourcefulness. If the number of raven nests and/or communal roosts on the transmission line towers appears to be increasing with each subsequent monitoring year, SDG&E will work with representatives from the BLM, USFWS, and California Department of Fish and Game to develop alternative acceptable measures to reduce the number of nests and communal roosts on the transmission towers.

3.0 MONITORING AND REPORTING PROGRAM

3.1 Objective

The objective of the raven monitoring and reporting is to document the activities performed pursuant to this plan, including documenting any increase in raven abundance during construction and perching/roosting/nesting activity after completion of the Sunrise Powerlink Project.

3.2 Methodology

During construction, daily reconnaissance level surveys will be conducted by the on-site biological construction monitor to determine any increase in raven abundance due to construction activities. Surveys will focus on any anthropogenic sources, material storage areas and other subsidies that may potentially attract ravens. Observations will include the location of the raven and whether it was flying, scavaging, perching, roosting, or nesting. The monitor will document these activities and any FTHL observations in the Project daily monitoring report, which will be submitted to the Project Environmental Field Monitor Manager. The daily reports will then be submitted weekly to the CPUC and a summary of the daily reports will be submitted monthly to the CPUC. Any inactive nests observed in the Project impact area during construction will be removed as discussed in Section 2.5 above. Likewise, any roosting activity will be discouraged as discussed in Section 2.6 above.

After construction is complete, during the ongoing operational and maintenance phase of the Project, a qualified raptor biologist will survey the towers along the transmission line for nests potentially used by ravens and for communal roosts, as directed in Section

2.5 and Section 2.6 above, respectively. The biologist will document any nest observations on the Nest Reporting Form (see Attachment C), submit the form to SDG&E's Environmental Services Natural Resources Group, and coordinate with SDG&E's TCM to remove any inactive nests observed on the towers as discussed in Section 2.5 above. Any observations of communal roosting will be documented by the biologist on the Roost Reporting Form (see Attachment D) and submitted to SDG&E's Environmental Services Natural Resources Group, which will coordinate with BLM and USFWS on methods to discourage roosting behavior as discussed in Section 2.6 above.

3.3 Annual Reporting

Annual reports will be sent to the BLM and USFWS no later than December 31 of each monitoring year following completion of construction. The annual report will include the following:

- completed Nest Reporting Forms for the monitoring year (see Attachment C),
- completed Roost Reporting Forms for the monitoring year (see Attachment D),
- a description of any nest removal procedures conducted during the monitoring year,
- a description of any roost discouragement procedures conducted during the monitoring year,
- a description of any correlation observed between the presence or absence of deterrents and raven perching, roosting, behavior, and nesting,
- a description of any incidental observations on raven perching, numbers, and behavior on both the Sunrise Powerlink and Southwest Powerlink,
- a description of any incidental observations of FTHL inside and outside the Sunrise Powerlink Project alignment and impact areas, and
- any suggestions for improvement in the existing raven control practices, as necessary.

4.0 REFERENCES

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