Common Raven Monitoring, Management, and Control Plan
Beacon Solar Energy Project

Docket 08-AFC-2

Prepared for:

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1.0 Introduction

This section introduces the project background, purpose, objectives, and conditions of concern related to raven monitoring, management, and control in the vicinity of the proposed Beacon Solar Energy Project (BSEP, or Project).

1.1 Background

The proposed BSEP is located along State Route 14 (SR-14), approximately 10 miles north-northwest of California City, approximately 15 miles north of the town of Mojave, and approximately 24 miles northeast of the city of Tehachapi, in Kern County, California (Figure 1). Landmarks in the area include Red Rock Canyon State Park approximately 3.6 miles to the north, Koehn Dry Lake approximately 5.4 miles to the east-northeast, and the Desert Tortoise Natural Area approximately 3 miles to the east.

Beacon Solar, LLC (Beacon) proposes to develop a 250-megawatt solar energy facility on approximately 2,012 acres. The BSEP would use parabolic trough solar thermal technology to concentrate the sun's energy on a linear receiver located at the center point of each parabolic solar subarray. Energy collected in the array would be used to generate steam, driving a turbine that generates electricity. This solar array would be located east of the Southern Pacific Railroad tracks, which run parallel to and east of SR-14. Two options are under consideration for a short (less than 3.5 miles) transmission line, which would be constructed from the solar array across SR-14 to interconnect with the Los Angeles Department of Water and Power's existing transmission system west of the site. Evaporation ponds, used to manage the cooling tower blowdown stream (a portion of the continuously circulated cooling water discarded to prevent the excessive buildup of salts), are planned within a highly disturbed portion of the Plant Site. A 17.6-mile, 8-inch natural gas line, which would connect an existing Southern California Gas pipeline in California City with the Project, would be constructed to provide fuel for startup and emergency operations.

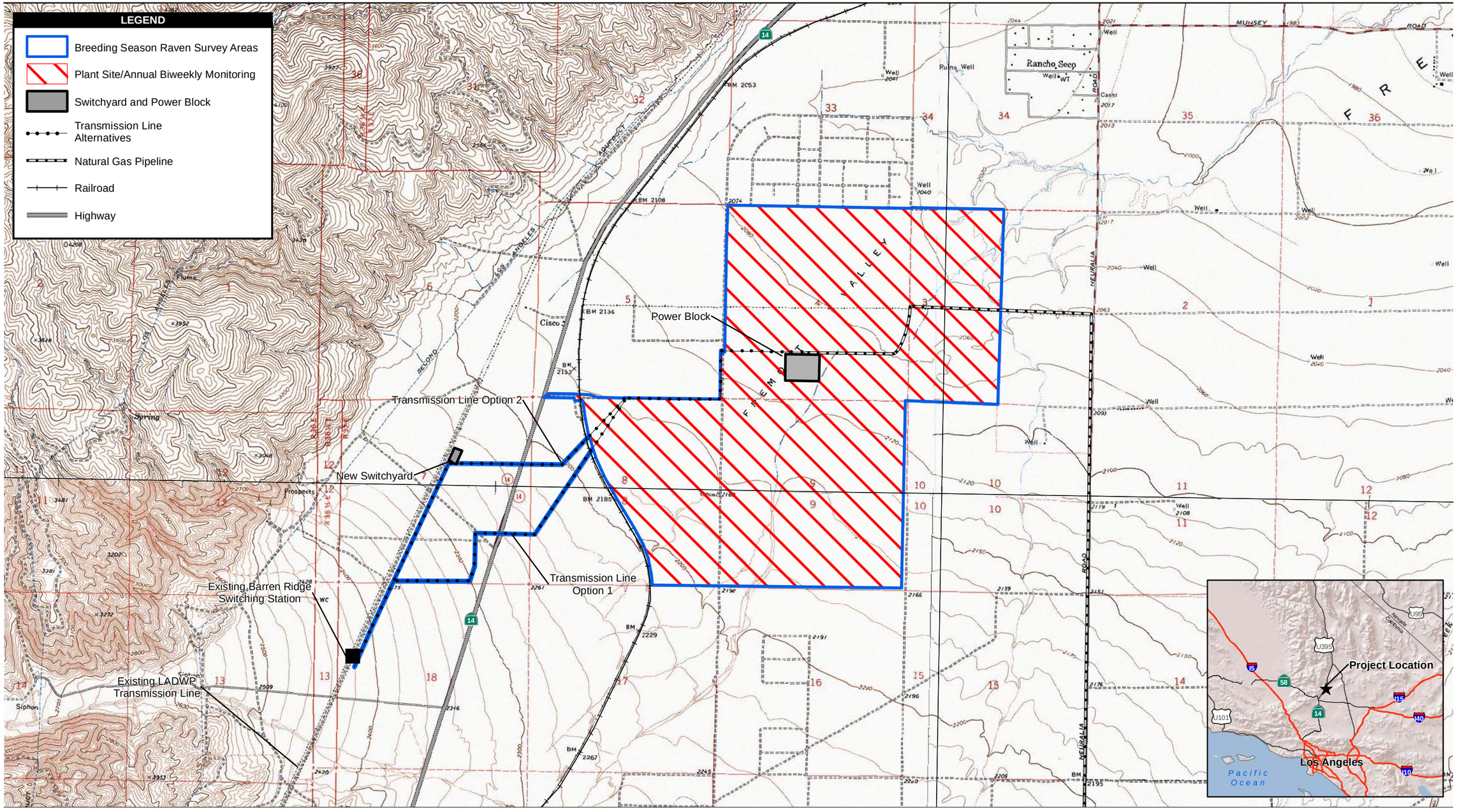
The proposed Project has the potential to indirectly impact populations of the desert tortoise, Mojave population (*Gopherus agassizii* [DT]), listed as threatened under the federal Endangered Species Act (ESA) and California ESA, by increasing the attraction of common ravens (*Corvus corax* [raven]) into the area and thereby increasing potential DT depredation by raven. While the proposed Plant Site is not on DT habitat, the movement of raven throughout the area and over potential DT habitat adjacent to and in the vicinity of the Project Area could increase the chances of a raven encountering and depredating a DT.

1.2 Purpose and Objectives

The purpose of this plan is to identify the conditions of concern specific to the BSEP that may attract ravens to the area and to define a monitoring, management, and control plan that will 1) monitor raven activity and 2) specify management and control measures that will avoid, minimize, or mitigate impacts. The monitoring effort is intended to provide qualitative data that can be interpreted by the Designated Biologist to determine if Project design features (PDFs) are working or if additional management and control measures are needed to mitigate impacts to DTs.

Specific plan objectives include:

1. Clearly identify how the Project would utilize PDFs to manage the conditions of concern specific to the BSEP that may attract ravens to the area.
2. Document the effectiveness of PDFs in addition to raven management and control measures implemented at the BSEP.



Source: TetraTech 2007; Kern County 2007; USGS 2007; WorleyParsons 2007; USGS 7.5' Topogrpahic Quadrangle Cantil 1973, Cinco 1994, Californa City North 1973, Mojave NE 1994

2,750 1,375 0 2,750 Feet

Scale: 1:33,000; 1 inch = 2,750 feet

Figure 1
Site Location and Raven Monitoring Areas

Path: P:\2008\08080001 FPLE Proj Beacon Solar\5GIS\MXD\Raven\Figure 1 Vicinity Map_MonitoringLocations.mxd, 03/06/09, SorensenJ

3. Specify how and when mitigation measures would be selected and implemented if the monitoring suggests the need for additional controls.

4. Define triggers for modification of management and control measures using adaptive management principles.

1.3 Conditions of Concern

The conditions of concern are those Project features or activities that, when not properly managed, provide new subsidies that may result in changes in raven population or behavior that could potentially adversely affect the DT population in the Project Area. Four basic conditions of concern have been identified for the BSEP and have been considered in developing this Plan:

1. Water from evaporation ponds;
2. Potential creation of new perching/roosting/nesting sites;
3. Water ponding potential from dust suppression; and
4. Construction/operation waste management.

The study design for raven monitoring, as well as measures for raven management and control, are dependent upon the accuracy of defining these conditions. Each of these conditions of concern is defined in more detail below.

Evaporation Ponds

The proposed Project includes evaporation ponds that will collect blowdown water from the cooling towers. The addition of a new water source to an area where water sources are generally sparse may result in the attraction of raven to the BSEP. Ravens will travel up to 40.4 miles from their roosts for subsidies, including water (Boarman, 2003). However, much shorter distances to point subsidies are more common and Kristan and Boarman (2003) observed that raven densities declined with increasing distance from point subsidies.

Perching, Roosting, and Nesting Sites

The majority of raven predation on DT is thought to take place during the spring, most likely by breeding birds that have been shown to spend most of their time foraging within 1,300 feet of their nests (Kristan and Boarman, 2003). Therefore, structures that facilitate nesting in areas ravens could not otherwise nest in may pose a danger to nearby DT populations. Project components, such as tower structures, transmission poles and lines, and support structures provide new elevated perching sites that have the potential to increase raven use of the Project Area.

Ponding Water

During construction, water will be applied to the graded areas, construction right-of-way, dirt roads, trenches, spoil piles, and other areas of ground disturbance to minimize dust emissions and topsoil erosion. Ponding water resulting from these dust suppression activities has the potential to attract ravens, thereby potentially resulting in increased DT predation by ravens. During operations, deionized water will be used to wash mirrors; however, the amount of water used will be minimal and is not anticipated to result in ponded water on site.

Waste Management

Ravens are considered scavengers that obtain a high percentage of their diet from human subsidies such as food sources brought on site by employees, landfills, dumpsters behind restaurants and grocery stores, open garbage drums and plastic bags placed on the curb for garbage pickup, and roadkill. Both the construction and operation phases of the BSEP would result in increased waste generation in the Project Area; improper waste management could attract ravens.

2.0 Regionwide Raven Management and Monitoring Program

On January 29, 2009, the U.S. Fish and Wildlife Service (USFWS) sent a letter to the California Energy Commission (CEC) describing a regional raven management and monitoring program that would include agreements with State and local governments and private project applicants (USFWS, 2009). Pursuant to this program, Beacon would contribute to the regionwide effort in an amount related to the anticipated level of the Project's adverse impacts to DT from predation by ravens. It is anticipated that the funds contributed by Beacon would be held by the National Fish and Wildlife Foundation as part of a Desert Conservation Fund until needed to implement the regionwide program. Beacon would contribute approximately $100,000 to the fund in lieu of conducting an onsite, Project-specific, statistically based raven monitoring program.

3.0 Roles and Responsibilities

3.1 Environmental Compliance Manager

Beacon shall assign an Environmental Compliance Manager (ECM) to the Project. The ECM is responsible for facilitating implementation of the environmental conditions of the Project. Typical ECM duties involve managing, supervising, and/or providing advice on work affecting air quality, water/streambed permit, and biological resources environmental compliance programs. The contact information for any ECM named to oversee the Project will be incorporated into the Final Biological Resources Mitigation Implementation and Monitoring Plan.

The ECM must have experience in the implementation of environmental compliance measures and must have specific training by the Designated Biologist to conduct biological monitoring activities specified in this plan.

3.2 Designated Biologist

Beacon shall assign a Designated Biologist to the Project. Beacon shall submit the resume of the proposed Designated Biologist, with at least three references and contact information, to the CEC Compliance Project Manager (CPM) for approval in consultation with the California Department of Fish and Game (Department) and USFWS.

The Designated Biologist will have the following background and training:

- Bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field; and three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society; and
- At least one year of field experience with biological resources found in or near the Project Area.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, in consultation with the Department and USFWS, that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the conditions of certification.

Beacon shall ensure that the Designated Biologist performs the activities specified in this plan as being their responsibility.

4.0 Management Practices

This section specifies management practices or PDFs to be implemented by the Project to address the conditions of concern identified in Section 1.3. The PDFs are designed to avoid

creation of new subsidies and thus minimize the potential for the Project to attract ravens. The four basic conditions of concern identified in Section 1.3 have been grouped into construction and operation phase conditions, as appropriate for the Project. Construction phase conditions are considered temporary and are anticipated to be avoided or minimized mainly by the implementation of management measures as defined in Section 4.1 below. Operation conditions will include management measures to minimize potential impacts and may require additional control measures based on the results of the monitoring program (Section 4.2).

4.1 Construction

Construction-phase impacts are considered more temporary in nature than operational impacts and would therefore require temporary management practices to avoid or minimize the potential to attract ravens to the BSEP. Construction-phase conditions of concern for the BSEP include ponding water, creation of potential nest and roost sites, and waste management.

4.1.1 Evaporation Ponds

Evaporation ponds may collect rainwater during the construction phase that could attract ravens. Monitoring will evaluate the presence of ravens during construction. If ravens are identified in the evaporation ponds, hazing will be employed to discourage use.

4.1.2 Perching, Roosting, and Nesting Sites

Construction activities may create temporary perch, roost, or nest sites for ravens by introducing equipment or materials to the landscape that provide height for ravens.

Monitoring will evaluate the presence of ravens during construction. If ravens are identified perching, roosting, or nesting on building materials, equipment, waste piles, or other construction debris, hazing will be employed to discourage use.

4.1.3 Ponding Water

To minimize the occurrence of ponding water, the application rates of water for dust suppression activities will be predetermined to minimize excessive application. The application rate should consider soil infiltration and evaporation rates. The ECM will patrol areas to ensure water does not puddle for long periods (more than 1 hour) and make recommendations for reduced water application rates where necessary as discussed in Section 6.0 (Adaptive Management). The fill station will be designed to adequately drain water to prevent ponding.

4.1.4 Waste Management

A trash abatement program will be established during the construction phase of the BSEP. Trash and food items will be contained in closed, secured containers on the Plant Site and removed daily to reduce the attractiveness to opportunistic predators such as ravens. Monitoring of the construction site as well as access roads will be conducted to expedite proper disposal of roadkill, including animals unearthed during grading. In addition, the WEAP will assist in ensuring that no trash or roadkill is available that might attract DT predators.

4.2 Operation

Operation-phase impacts are considered ongoing impacts and would therefore require PDFs and ongoing management practices to avoid or minimize the potential to attract ravens to the BSEP. Operation-phase conditions of concern for the BSEP include evaporation ponds, perching, roosting and nesting sites, and waste management.

4.2.1 Ponding Water

To minimize the occurrence of ponding water, the application rates of water for dust suppression activities will be predetermined to minimize excessive application. The application rate should consider soil infiltration and evaporation rates. The ECM will patrol areas to ensure water does not puddle for long periods and make recommendations for reduced water application rates where necessary. During operations, deionized water will be used to wash mirrors; however, the amount of water used will be minimal and is not anticipated to result in ponded water onsite.

4.2.2 Evaporation Ponds

PDFs to deter use of the ponds by ravens include design features that will make the pond water less available to ravens (e.g., steep pond sides, at least 2 feet of freeboard, and perimeter protection). In addition, reducing other potential site attractants (see below) will assist in reducing the overall attractiveness of the Plant Site to ravens.

Because the ponds need to remain uncovered to maximize evaporation rates, a series of avian deterrence measures are being incorporated into the design and operation of the evaporation ponds that would minimize access to the ponds by birds. The operational design of the ponds includes a minimum depth of 2 feet and a minimum freeboard of 2 feet so ravens cannot reach the water from the perimeter. If discharge water needs to be rerouted to specific ponds to maintain a 2-foot minimum depth, the remaining ponds would be pumped dry. In addition, the interior sides of the ponds would be relatively steep at a 33 percent slope (3:1, horizontal:vertical). Other options include the use of antiperching devices placed strategically along the perimeter of the ponds to exclude ravens and other birds from accessing the edge of the ponds to drink water. These design features would make it difficult for perching birds (e.g., ravens) and/or shorebirds and wading birds to access the water.

The Project's ECM would be responsible for making qualitative observations on the relative success of the deterrent(s) at each pond and providing recommendations for future improvements in monthly reports. The Designated Biologist will review these reports and make recommendations regarding adapting the current configuration of the antiperching devices to maximize deterrence.

4.2.3 Perching, Roosting, and Nesting Sites

PDFs would be implemented to avoid introducing new subsidies by minimizing the attractiveness of Project components. Potential PDFs that would be considered to reduce impacts from these Project components primarily include the use of physical bird deterrents such as, but not limited to, bird spikes, Bird-B-Gones, and WhirlyBirds. In addition, nest removal would occur in conjunction with monitoring, as discussed below in Section 5.3.

4.2.4 Waste Management

The trash abatement program developed for the construction phase will also include operation-phase measures to be implemented for the life of the Project. Trash and food items will be contained in closed, secured containers and removed daily to reduce the attractiveness to opportunistic predators such as ravens. The ECM will continue to ensure that these practices are enforced and make recommendations for improvements where applicable as discussed in Section 6.0.

5.0 Monitoring Practices

Semi quantitative and qualitative monitoring will be implemented to assess the efficacy of PDFs and management measures and to determine the need for implementing additional control measures. These monitoring practices are intended to evaluate the potential impacts that construction and operation may have on raven activity and populations, which could result in potential impacts to DT. Raven monitoring will be implemented in the construction and operation

phases of the BSEP. The monitoring program is designed as an observational reconnaissance level study aimed at monitoring the effectiveness of the PDFs and management measures implemented with the goal of avoiding new subsidies for ravens in the Project Area and evaluating the overall effects of the Project and specific Project components (i.e., evaporation ponds) on the raven population (e.g., activity or presence).

5.1 Construction Phase

To identify potential increases in raven activity, the ECM will conduct at least weekly reconnaissance level surveys in the Project Area. Surveys will focus on all potential subsidies including waste disposal areas, erected structures, staging areas where large equipment or material may be stored, any area where water is applied to control dust and erosion or there are recent surface disturbances.

Data will be recorded for each raven observed, including activity, categorized as flying, perched, or on the ground (likely scavenging); type of perch (if applicable); and the general location of the bird within the Project Area. In addition, any nesting locations will be recorded and unoccupied nests will be removed (see Section 5.3 for a discussion on nest removal). Data sheets will be developed and submitted to the agencies prior to implementation of this plan, after final Project design is complete.

5.2 Operation Phase

To identify potential increases in raven activity during the operation phase of the BSEP, the ECM will conduct biweekly (i.e., every other week) reconnaissance level monitoring at the Plant Site for the life of the Project in addition to annual breeding season raven monitoring at the Plant Site and all associated aboveground linear components (Figure 1).

5.2.1 Ongoing Biweekly Raven Monitoring

The ECM will conduct biweekly surveys for raven activity at predesignated locations throughout the Plant Site for the first five (5) years of Project operation. The ECM will be accompanied by the Designated Biologist during the first four surveys to facilitate appropriate data collection. Surveys will begin when the plant is operational and continue every 2 weeks (biweekly) for the first five (5) years of Project operation. Survey locations will focus on Project components that may influence raven abundance, activity, and behavior by potentially allowing perching, roosting, and nesting opportunities or by providing supplemental resources such as food and water. These Project components include tower structures, transmission poles and lines, and support structures, as well as evaporation ponds and waste disposal facilities.

Sampling will occur every other week. Up to five (5) permanent sampling locations in addition to a stationary sampling point at each evaporation pond (three (3) points subject to reduction to one strategic point) will be identified by the Designated Biologist throughout the Plant Site based on areas that have the greatest likelihood of attracting ravens (e.g., tower structures, transmission poles and lines, evaporation ponds, and waste facilities).

A five-minute sampling session observing and listening for ravens will occur at each sampling location. The surveyor will record raven detections and will document the behavior of the raven (e.g., perched, flying, on the ground, nesting), perch type (if applicable), and distance and direction from the sampling location. Additional data collected will include the survey start/stop time, and weather (including temperature, average wind speed, and percent cloud cover). In addition, the location of any nests detected during a survey will be noted and Universal Transverse Mercator (UTM) coordinates recorded immediately following the conclusion of the sampling session. To aid the ECM and ensure consistency throughout the duration of the Project's life, a data sheet will be prepared in advance outlining the required data to be collected. Surveys will be conducted unless wind or rain interferes with audible or visual detection of ravens.

5.2.2 Breeding Season Raven Surveys

Breeding season surveys will occur biweekly (2-week intervals) starting at the beginning of the typical breeding season (mid-February) and continue to the end of June to identify nests and evidence of predation at nests (Boarman, 2002, 2003). Surveys will be conducted by the Designated Biologist during the first breeding season survey period. The ECM will accompany the Designated Biologist during the first season and complete subsequent breeding season surveys. If there is a change in the ECM, any new ECM would need to receive training by the Designated Biologist. These surveys will be conducted during the first five (5) years of Project operation on BSEP-owned lands and along the new transmission line. Each survey will consist of systematically searching the Survey Area, which includes the Plant Site and the aboveground linear features associated with the Project (Figure 1). In addition, surveys on the Plant Site will continue for the life of the Project. Because the 17.6-mile natural gas pipeline is an underground linear component of the BSEP that will not act as a potential raven attractant, it will not be surveyed. Figure 1 currently depicts two (2) transmission line alternatives; only the final selected option will be included in the breeding season surveys.

Surveys will be conducted by vehicle when possible and on foot when necessary. All Joshua trees, landscape trees, utility poles, transmission towers, and other structures within the Survey Area will be searched for nests. A UTM coordinate, as well as nesting substrate and current breeding status (if detectable), will be recorded for each nest located. Once data have been collected, the ECM will determine if the nest is unoccupied (i.e., no eggs in the nest or nestlings have fledged), in which case the nest will be removed by the ECM (see description of nest removal below). The ECM will search a 30-meter radius surrounding each nest or perch site for evidence of DT predation. All DTs depredated will be photographed, a UTM coordinate collected, and the length measured (or estimated). In addition, each DT will be marked to avoid duplication of data recording on subsequent surveys. If occupied nests are detected during surveys, Beacon will notify the Raven Management Workgroup for assistance with control measures.

Descriptions of nesting behavior and DT predation will be semi-quantitative and qualitative and will produce data that is valuable for assessing raven behavior and documenting potential problem individuals for management actions. In addition, an increase in the number of raven nests in the Project vicinity may suggest the potential need for revisions to PDFs or additional control measures (as described in Section 6.0).

5.3 Nest Removal

The majority of raven predation on DT most likely occurs in the spring, from April to May, when DT are most active and ravens are feeding young (Boarman and Heinrich, 1999). As such, the removal of unoccupied raven nests would be utilized to control DT predation. During discussions between Beacon, USFWS, and the Department in December 2008, the agencies agreed that raven nest removal may be conducted as part of Project-specific raven management efforts (see also USFWS 1/29/09 letter to CEC). Nests will be removed only from within Beacon-controlled lands and the transmission line right-of-way. If nests are observed on adjacent lands, the resource agencies will be notified. The removal of unoccupied nests will occur simultaneously with the breeding season raven surveys that will take place from mid-February to the end of June. Removing raven nests outside of the breeding season may have a smaller effect on the raven population since they may readily rebuild the following season. However, evidence suggests that birds with no nest in their territory at the beginning of the breeding season were less likely to commence nesting than those who already had an intact nest (Kristan and Boarman, 2003). As such, if an unoccupied raven nest is detected outside of the breeding window during biweekly surveys, it will also be removed by the ECM.

6.0 Adaptive Management

This section defines how adaptive management principles will be applied to this Plan, specifically in reference to PDF and control/mitigation measure implementation. This section defines potential changes to the mitigation and conditions that may trigger them.

6.1 Definition

Adaptive management is typically used in environmental management efforts to facilitate more effective management of resources to achieve desired objectives. Adaptive management can be defined as an iterative and structured optimal decision-making process intended to reduce uncertainty through system monitoring. The decision-making process simultaneously maximizes one or more resource objectives and accrues information needed to improve future management, either actively or passively. Using current knowledge, passive adaptive management involves the use of conceptual modeling to guide management actions. The model is adjusted as new knowledge is obtained and management decisions are subsequently modified. Active adaptive management involves testing alternative hypotheses through system manipulation employing management strategies. Thus, passive adaptive management is based on information gained from observational studies, whereas active adaptive management is based on information gained from experimental manipulation (Holling, 1978). This plan will focus on passive adaptive management but may ultimately apply both passive and active adaptive management.

6.2 Adaptive Management Triggers

To facilitate meeting plan objectives, it may be necessary to make changes to the PDFs or initiate the implementation of additional control measures. Implementation of adaptive management measures (described below in Section 6.3) would occur if both of the following conditions are met:

a. The results of the biweekly and/or annual breeding season raven monitoring events suggest that current PDFs are ineffective at controlling substantial and sustained increases in raven occurrences in the Plant Site, thereby increasing the potential for DT predation.

b. Beacon makes every attempt to adjust PDFs to control raven occurrences and avoid the need for additional control measures, and has contacted and worked with the Designated Biologist and the resource agencies to identify other sources of ravens and/or management measures; however, increased raven occurrences continue.

6.3 Adaptive Management Measures

Adaptive management measures will be identified during implementation of the monitoring program but would be discussed with Beacon and the appropriate resource agencies before any decisions are made. Adaptive management measures may include modifications to PDFs, monitoring strategies, or implementation of additional control measures. Key examples would be 1) modifications to the monitoring program survey frequency, including reduction of the monitoring frequency and survey points, should results of surveys deem it to be warranted, 2) eliminating or refining a PDF or management measure if it is not working, or 3) incorporating a defined control measure, if impacts are observed, that would not otherwise be implemented (triggered). Potential control measures are discussed in more detail below.

6.3.1 Control Practices

If the results of the monitoring efforts suggest that there is a substantial and sustained (e.g., consecutive years) increase in raven activity that may result in DT predation, even with the implementation of PDFs as defined in Section 4.0, then Beacon may need to implement additional measures to further control ravens at the Project site. This section defines the types of control practices that may be implemented if additional measures are determined to be necessary based on the adaptive management triggers described above.

As stated above, prior to the implementation of any control measure, the Designated Biologist and Beacon would coordinate the discussion and approval of control measures with the appropriate resource agency representatives. The control measures proposed to be implemented must be agreed to by the appropriate Project resource agency representatives and Beacon. If no identified control measures accomplish appropriate raven management objectives, additional control measures such as netting will be reassessed for potential implementation.

Roadkill Removal

Ravens are well known for eating animals that have been killed along roads and highways, which are often abundant in the desert region (Boarman and Heinrich, 1999). Roadkills provide a food source for ravens, which facilitates increased raven nesting near roads and highways in areas that might otherwise offer little food (Kristan et al., 2004). Due to the unlikely presence of roadkill on the Project site, roadkill removal is considered unlikely; however, the ECM will document the occurrence of roadkill during the biweekly raven monitoring events. Operations staff will also report roadkill on a daily basis if found. Monitoring of roadkill will focus on the Project Area, in particular the Plant Site, with associated paved and dirt roads, and the staging area, but also including any other Project facilities that may support vehicular traffic, including construction equipment. If roadkill occurs frequently in the Project Area and if ravens are commonly noted feeding on roadkill, it may be appropriate for Beacon to implement a roadkill removal program. Details of a roadkill removal program would be designed by the ECM in coordination with the Designated Biologist and the appropriate resource agencies.

Hazing

Hazing may use any number of visual and/or auditory devices designed to scare birds, including air or gas cannons, human flushing, bioaccoustic deterrents, and/or flags and streamers to create an integrated system of negative stimuli. Because many birds will become accustomed to methods quickly, many of these techniques are used in combination. If deemed appropriate, a hazing program would be designed by the Designated Biologist in coordination with the ECM and the appropriate resource agencies. Permission may also be required from the local police or municipality, as there may be local ordinances that prohibit the creation of loud noises.

Methyl Anthranilate

Methyl anthranilate (MA) is a naturally occurring GRAS (generally recognized as safe) listed compound used as a food flavoring and fragrance additive. Chemical formulations containing MA have been found to be effective bird aversion agents as MA acts as chemosensory repellent, irritating pain receptors associated with taste and smell (Umeda and Sullivan, 2001). When applied as a formulated spray, MA has been found to be effective in repelling birds from feeding on crops such as cherries, blueberries, and table grapes. In addition, MA is used as a repellent for Canadian geese on lawns and in small pools of water. To date MA is thought to have limitations for topical application as it is considered highly volatile and breaks down readily under exposure to ultraviolet light. The most appropriate application of MA on the BSEP would be to small areas of ponding water or perhaps where known nesting has previously occurred. Repeat topical application would be necessary due to the breakdown of the chemical with exposure but may still prove useful as a short-term deterrent. After removing a current season unoccupied nest, the ECM could apply MA to deter nest rebuilding in that location. Prior to the use of MA at the BSEP, research into the most current application of MA to deter raven activity should be conducted by the Designated Biologist and then methods could be designed in coordination with the ECM and the appropriate resource agencies.

Lethal Removal (Depredation)

If ravens are still attracted to the BSEP even after the implementation of PDFs, modification to PDFs, and implementation of control measures, it may be necessary to consider lethal removal. There is no evidence that lethal removal will have a long-lasting effect on raven population levels, raven foraging behavior, or survival of juvenile DT. In addition, identifying, targeting, and successfully removing individuals is also considered time consuming. However, this method is often used in management plans when specific raven pairs are determined to be responsible for

taking relatively large numbers of DT (Boarman, 2002). These individuals can often be identified by the presence of juvenile DT shells beneath their nests, which are often used for consecutive years by the same pair of breeding ravens (Boarman and Heinrich, 1999). By removing those birds known to prey on DT, survival of juvenile DT in that vicinity may increase. However, it is very difficult to identify the target bird(s) with absolute certainty, much less locate and shoot both members of a pair.

Under this control method, targeted ravens would be shot by rifle or shotgun. If shooting is not possible (e.g., on power lines) or has been unsuccessful, ravens could be trapped and humanely euthanized. Young ravens found in nests of removed adults need to be euthanized humanely if they can be captured safely.

7.0 Reporting

The ECM will prepare monthly monitoring reports during construction and the first year of operation summarizing the results of the biweekly and breeding season monitoring events as well as observations reported by operations staff and describing any noted raven activity in the Project Area. Following the first year of operation, reports will be submitted annually. These reports will summarize the survey results, discuss the success or failure of PDFs, and make recommendations for modification of PDFs or implementation of control measures as necessary. These monitoring reports will be submitted to Beacon and the Designated Biologist for review. Beacon will forward the reports to the Project resource agency representatives.

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BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA

APPLICATION FOR CERTIFICATION FOR THE BEACON SOLAR ENERGY PROJECT	DOCKET NO. 08-AFC-2

PROOF OF SERVICE
(Revised 2/9/09)

APPLICANT	**COUNSEL FOR APPLICANT**	**ENERGY COMMISSION**
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Declaration of Service

I, Lois Navarrot, declare that on March 10, 2009, I served and filed copies of the attached **Beacon Solar Energy Project's Common Raven Monitoring, Management, and Control Plan.** The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: www.energy.ca.gov/sitingcases/beacon. The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service List) and to the Commission's Docket Unit, in the following manner:

(check all that apply)

For Service to All Other Parties

__X__ sent electronically to all email addresses on the Proof of Service list;

__X__ by personal delivery or by depositing in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service List above to those addresses **NOT** marked "email preferred."

AND

For Filing with the Energy Commission

__X__ sending an original paper copy and one electronic copy, mailed and e-mailed respectively, to the address below **(preferred method)**;

OR

_____ depositing in the mail an original and 12 paper copies as follow:

California Energy Commission
Attn: Docket No. 08-AFC-2
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

_____/s/_____
Lois Navarrot