

**Appendix H
(continued)**

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MEMORANDUM

BY ELECTRONIC MAIL

TO: U.S. Fish and Wildlife Service

DATE: November 26, 2013

RE: PCW's compliance with the Service's comprehensive eagle avoidance and minimization recommendations

As recommended in the Eagle Conservation Plan Guidance (ECP Guidance) and Land-based Wind Energy Guidelines (Wind Energy Guidelines), Power Company of Wyoming LLC (PCW) has worked closely with the U.S Fish and Wildlife Service (Service) to identify eagle avoidance and minimization measures for Phase I of the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project). This memorandum documents PCW's compliance with the eagle avoidance and minimization measures recommended by the Service.

PCW has completed a preliminary site evaluation, site characterization, and site-specific surveys and assessments (field studies) for the CCSM Project. PCW and the Service used these field studies to conduct a risk assessment for the CCSM Project and to identify conservation measures to avoid and minimize the take of eagles. Specifically, the Service provided recommendations to PCW in letters dated August 10, 2012, May 3, 2013, and October 1, 2013; the Service offered additional recommendations, modifications, and detail on the implementation of its recommendations at meetings held on May 15, 2013 and July 24, 2013.

As requested by the Service and as contemplated under the ECP Guidance and Wind Energy Guidelines, PCW has used the site-specific data for the CCSM Project and the recommendations from the Service, in conjunction with the initial results of the Service's eagle fatality model, to substantially re-design the CCSM Project and develop the Phase I wind turbine layout, (Figure 1 and Figure 2). The Phase I wind turbine layout avoids and minimizes risks to eagles such that additional take is unavoidable, consistent with the ECP Guidance and the provisions of the Bald and Golden Eagle Protection Act.

Phase I Wind Turbine Layout

PCW has worked cooperatively with the Service to incorporate its avoidance and minimization recommendations resulting in substantially revising the CCSM Project, specifically, the Phase I wind turbine layout. PCW has adopted the Service's recommendations set out in the August 10, 2012, May 3, 2013, and October 1, 2013, letters, as modified and clarified at the May 15, 2013 and July 24, 2013 meetings and has implemented them as provided by the Service, with the

exception of Prey Recommendation 3, BBCS Recommendations 1 and 2, and Use Recommendation 3. As to these limited exceptions, PCW, relying on site-specific data, has identified alternate approaches to implementing the Service's recommendations that provide equivalent or even greater protection to bald and golden eagles. These alternate implementation strategies are addressed in detail in this Memorandum.

A fundamental element of the Phase I wind turbine layout is the designated Turbine No-Build Areas (Figure 3). These areas are designed to reduce impacts to eagles and other raptors by avoiding placement of turbines in and adjacent to documented important eagle use areas, movement corridors, and nest locations and nesting substrate. Eagle use within the designated Turbine No-Build Areas represents approximately 80% of all use observed during the 2011 and 2012 long-watch raptor surveys. As such, designation of these areas substantially reduces the risk to eagles.

The Phase I wind turbine layout incorporates the designated Turbine No-Build Areas and the avoidance and minimization measures (Figures 4 and 5), as described below. The layout is in full compliance with the ECP and WEG Guidance and represents the culmination of an iterative approach to siting and site characterization consistent with Stages 1 and 2 of the ECP Guidance and Tiers 1 through 3 of the WEG Guidance. The layout, when combined with approved or experimental Advanced Conservation Practices, conservation and mitigation measures, and monitoring and adaptive management, avoids and minimizes impacts to bald and golden eagles such that additional take is unavoidable.

Avoidance and Minimization Recommendations

The avoidance and minimization recommendations developed by the Service focus on identifying and avoiding areas such as occupied and unoccupied nests, areas of concentrated prey base, and movement corridors. From the initial letter in August 2012 through the information provided in October 2013, the Service continued to refine its recommendations to add specificity and to reflect the additional site-specific data and information that was collected for the CCSM Project.

The recommendations provided by the Service in its May 3, 2013 letter have become known as Recommendations A through D. Recommendations A through D refer to the following:

- Recommendation A – Occupied Nests
- Recommendation B – Unoccupied Nests
- Recommendation C – Areas of Concentrated Prey Resources
- Recommendation D – Other Project-specific Eagle Activity Areas

The recommendations made by the Service for the CCSM Project and information regarding how each recommendation is incorporated into the Phase I wind turbine layout is organized by subject matter in the following sections: (1) Nests (Recommendations A and B); (2) Areas of Concentrated Prey Resources (Recommendation C); (3) Other Project-specific Eagle Activity Areas (Recommendation D); (4) Miller Hill; and (5) Non-eagle Raptors.

Nests (Recommendations A & B)

“Important eagle-use areas” as defined in 50 CFR 22.3 include eagle nests and important landscape features in close proximity to eagle nests. As such, significant effort was expended by

PCW and the Service to identify eagle nests in the vicinity of the CCSM Project Site and to create recommendations to protect the nests and important landscape features. The majority of the eagle nests identified by PCW are far removed from the Phase I development or lie within designated Turbine No-Build Areas designed to protect them; however, for the two occupied golden eagle nests, the occupied bald eagle nest, and the inactive nests within five miles of the Phase I wind turbine layout, PCW and the Service worked cooperatively to develop recommendations and protective measures.

On August 10, 2012, the Service provided PCW with its initial recommendations for the protection of nests and nesting territories.¹ On May 3, 2013, following a review of the 2011-2012 survey data and discussion regarding the initial recommendations, the Service clarified its initial recommendations. The Service defined occupied nests as any nest that has been used for nesting within the previous five calendar years or five years of survey. Unoccupied nests were defined as those nests that have not been used for nesting in the previous five calendar years or years of survey.

Subsequently, on May 15, 2013, PCW and the Service met to discuss how the recommendations provided in the May 3, 2013, letter could be implemented at the CCSM Project. At the May 15, 2013 meeting, the Service provided maps that illustrated the implementation of the Service's recommendations in relation to nest #162, nest #145, and the unoccupied nests in the Chokecherry wind development area. The Service subsequently refined its recommendations based on additional data PCW submitted to the Service on May 30, 2013. The Service presented its refined recommendations for the protection of nests and nesting territories at a meeting on July 24, 2013. These included verbal recommendations related to curtailment, as well as maps illustrating recommendations for nest #162 and nest #145 that superseded those previously discussed on May 15, 2013.

The following list of recommendations relating to nests and nesting territories have been compiled from the letters, maps and guidance provided by the Service, as referenced above. Each recommendation is followed by a discussion of how PCW has incorporated the recommendation in the Phase I wind turbine layout.

Nest Recommendation 1. *For occupied golden eagle nests, we recommend a turbine no-build buffer within the project specific 1/2-mean inter-nest distance (1/2-MIND). The 1/2-MIND buffer approximates the average territory size and is based on an average distance among all occupied nests within a given year. Eagle pairs that nest within one-half the mean project-area inter-nest distance are potentially susceptible to disturbance take and blade strike mortality, as these pairs and offspring may use the project footprint (ECPG 2013, p. 14). The 1/2-MIND can be adjusted at individual nests if site-specific data (e.g., telemetry data, prey*

¹ Only those recommendations that apply to the Phase I wind development are addressed in this memorandum.

*analysis, other data) are adequate to show eagle activity around the nest is non-circular or that the territory is larger or smaller than the 1/2-MIND.*²

For CCSM, the project-specific 1/2-MIND is 3,500 meters (about 2.2 miles), which is based on data from 2011, the year with the highest number of occupied nests. Absent sufficient data, turbines should not be built within 3,500 meters of occupied nests. [recommended 05/03/13, superseded by Nest Recommendations 3 and 4]

Only two occupied golden eagle nests were identified within the Phase I development area, nest #162 and nest #145. All other occupied golden eagle nests in the vicinity of the CCSM Project Site are 5 miles or more from the Phase I development area and the 1/2-MIND for these nests does not intersect with the Phase I development area. Consistent with the ECP Guidance, site-specific recommendations were developed for both of the occupied nests within the Phase I development area. Therefore, because there was sufficient site-specific information, this more general recommendation was used along with the site-specific data to develop Nest Recommendations 3 and 4 which supersede this recommendation. See PCW's response to Nest Recommendations 3 and 4 for the measures used to protect eagles that may use nest #162 or nest #145.

Nest Recommendation 2. *We recommend that turbines not be constructed within 800 meters (0.5 mile) of any unoccupied (historic) golden eagle nest, and that all turbines between 800 meters and 1,600 meters (1.0 mile) of any unoccupied nest are curtailed during each year starting 15 January until 1 May, or until adequate nest surveys demonstrate that the nests are unoccupied. Further, if the nest becomes occupied, turbines within the 1/2-MIND of the nest should be curtailed during the breeding season until the young fledge and are no longer dependent on the nest or until the nest becomes unoccupied.*³ [recommended 05/03/13, detailed 05/15/13 (map 5)]

In compliance with Nest Recommendation 2, there are no turbines within 800 meters of any golden eagle nest (occupied or unoccupied) in the Phase I wind turbine layout (Figure 1 and Figure 2). In addition, PCW has removed many turbines from locations within 1,600m of golden eagle nests, e.g. 19 turbines located within 1,600 meters of the two unoccupied nests located immediately east of nest #145 were removed from the preliminary Phase I wind turbine layout (Figure 5) .

Where turbines are still located within 1,600m of a golden eagle nest, turbines will be curtailed between February 1 and April 30 or until nest activity is determined. While the Service recommended seasonal curtailment from January 15 through May 1, PCW is proposing to curtail turbines seasonally between February 1 and April 30 based on site-specific data. The attached histogram generated from 800-meter point count data

² This recommendation continues to specifically define occupied golden eagle nests. The recommendation also notes that based on information already submitted by PCW, adjustments to the 1/2-MIND buffer may be appropriate at some occupied nests based on site-specific data collection.

³ This recommendation continues to specifically define unoccupied golden eagle nests.

collected in 2012 and 2013 demonstrates that eagle use of the Phase I development area is very low during January and increases in mid-February (Figure 6). Because of the extremely low documented use in January, PCW proposes to begin seasonal curtailment on February 1 of each year and continue seasonal curtailment until the activity of each nest is determined.

Attached Figures 4 and 5 show the measures applied to unoccupied golden eagle nests within the Phase I development area; these nests are located along Sheep Mountain, Bolten Rim and in the northern portion of the Chokecherry wind development area.

Nest Recommendation 3. *Add avoidance area around GOEA nest #162 at SW corner of Sierra Madre. [recommended 08/10/12, updated 05/15/13 (map 1) and 07/24/13 (map 3)]*

Nest #162 is located in the southwest corner of the Sierra Madre Phase I development area. The nest is located on a ledge along the southwest face of a small, pyramid-shaped mesa. Areas within the ½-MIND surrounding Nest #162 were surveyed in 2011 through 2013. Nest #162 was only active in 2011. During the period in which the nest was active, approximately 100 hours of survey data were collected to document flight paths and use surrounding the nest. An additional 163 hours of survey data were collected within the ½-MIND surrounding this nest in 2011 following the fledging of the juvenile golden eagle. Collectively, these data were used to identify site-specific avoidance and minimization measures for Nest #162.

Eagle flight path data collected during the period in which the nest was active in 2011 indicates that the majority of the observed eagle activity occurs south and west of the nest location in an area with documented greater sage-grouse use and pronghorn fawning activities. Two of the greater sage-grouse that were fitted with GPS transmitters by PCW were preyed upon by the eagles occupying this nest location as evidenced by the transmitters being relocated inside and at the base of the nest. Inspection of the nest after fledging indicated that the majority of prey remains in the nest were greater sage-grouse and pronghorn. Areas to the north and east of the nest within the Phase I development area do not provide suitable habitat for consistent use by pronghorn or sage-grouse; this information and the lack of observed eagle flight paths in this area during the nesting period indicate that use from this nest occurs mainly outside of the Phase I development area to the south and west.

While nest #162 has only been active for one year during monitoring, large amounts of data have been collected and used by PCW and the Service to develop site-specific measures for the protection of eagles that may use nest #162. As shown on attached Figure 4, no turbines will be built within 800m of the nest. In addition, as described in Nest Recommendation 2, turbines will be curtailed seasonally within 1,600m of the nest between February 1 and April 30 or until nest activity is determined. If nest #162 is active, turbines within the ½-MIND north and east of the nest location will be operated normally with no curtailment while the remaining turbines within the ½-MIND will be curtailed during the breeding season until the young fledge and are no longer dependent on the nest or until the nest fails and becomes inactive (Figure 4). Due to the majority of the use associated with nest #162 occurring to the south and west, this curtailment

strategy is protective of eagles that may use nest #162 and is consistent with the ECP Guidance which provides for use of site-specific data to identify appropriate, practicable avoidance and minimization measures. The avoidance and curtailment measures applied to nest #162 are shown in attached Figure 4 – Sierra Madre Avoidance and Minimization Measures. Nest Recommendation 2 would be applied to nest #162 in the event that it becomes unoccupied after 5 calendar years or 5 survey years.

Nest Recommendation 4. *Collect additional data on eagle use at the GOEA nest in Chokecherry West [refers to GOEA nest #145], including foraging areas. If inactive, describe likely foraging areas and potential use within Chokecherry West. Expand avoidance area in NW to protect eagle use near the nest. [recommended 08/10/12, updated 05/15/13 (map 2) and 07/24/13 (map 2)]*

Nest #145 is located on a northwest facing cliff band along the north central edge of the Chokecherry Phase I development area. Nest #145 was surveyed in 2008 and 2011 through 2013. Nest #145 was only active in 2008. Site-specific recommendations have been developed for nest #145 based on topographic features, potential prey-base locations, and eagles use observed in the vicinity of the nest.

In compliance with the Service's site-specific recommendations, PCW has not located turbines within 800m of nest #145 in the Phase I wind turbine layout. In addition, PCW agrees with the Service that seasonal curtailment is appropriate within 1,600m of nest #145 and is protective of eagles. However, rather than curtailment, PCW has complied with the Service's recommendation by removing 13 turbines within 1,600m of nest #145 from the preliminary Phase I wind turbine layout (Figure 5).

The site-specific measures developed for nest #145 protect the nest and provide a flight corridor connecting nest #145 with the Turbine No-Build Areas in the Chokecherry Phase I development area. These measures avoid topographic features potentially used by eagles and provide connectivity to the Interior Chokecherry Rim Turbine No-Build area and potential prey resources located northeast of the nest. The measures are consistent with the ECP Guidance which provides for use of site-specific data to identify appropriate, practicable avoidance and minimization measures. The measures applied to protect eagles that may use nest #145 are shown in attached Figure 5 – Chokecherry Avoidance and Minimization Measures. Nest Recommendation 2 would be applied to nest #145 in the event that it becomes unoccupied after 5 calendar years or 5 survey years.

Nest Recommendation 5. *Confirm BAEA use around Rasmussen Lake and adjust avoidance area if necessary to protect eagles from nest #171 as well as fall and winter eagle use [recommended 08/10/12]*

In its August 10, 2012, letter, the Service identified that the ½-MIND for bald eagle nests in the CCSM Project Site is 3,686 meters. The Phase I wind turbine layout does not contain any turbine locations within the ½-MIND surrounding bald eagle nest #171 (Figure 1). Additionally, between 2011 and 2012 more than 325 hours of survey data were collected across all seasons at three sites surrounding Rasmussen Reservoir as part

of long-watch surveys. These data show that use of the Phase I Development area by bald eagles occurs primarily between the nest and Rasmussen Reservoir. Based on these data, the Rasmussen Reservoir Turbine No-Build Area (Figure 3) was designated to create a use area around the reservoir as well as a flight corridor between nest #171 and the reservoir where foraging behavior by bald eagles has been observed.

Nest Recommendation 6. *Evaluate and/or model the geologic features and potential flight paths and foraging areas to estimate the areas of high eagle use in the event these inactive nests (territories) are reoccupied. Based on results of the modeling or site-specific evaluation, adjust the proposed avoidance area to protect areas of highest eagle use.* [recommended 08/10/12, superseded by Nest Recommendation 2 and Use Recommendations 1 through 6]

Nest Recommendation 6 while specific to inactive nests and nesting territories has largely been superseded by the more specific Nest Recommendation 2 and the “other project-specific eagle activity areas” recommendations (Use Recommendations 1 through 6). PCW has evaluated the CCSM Project Site and Phase I development area for geologic features and potential flight paths and foraging areas that may be associated with high eagle use if unoccupied nests and nesting territories become active and has applied the measures described in Nest Recommendations 1 through 8 and Use Recommendations 1 through 6, along with the designated Turbine No-Build Areas to protect potential high eagle use areas associated with unoccupied nests and nesting territories.

Nest Recommendation 7. *The Service clarified that curtailment, as contemplated in Nest Recommendations 1 through 5, only applies during daylight hours when eagles are active. The Service further indicated that it defines daylight hours as ½ hour before sunrise to ½ hour after sunset in the absence of site-specific data.* [recommended 07/24/13 (meeting notes)]

When turbines are curtailed, as contemplated in Nest Recommendations 1 through 5, turbines will be curtailed during daylight hours (sunrise to sunset). The Service has recommended curtailment for ½ hour before sunrise to ½ hour after sunset; however, site-specific long-watch survey data collected in 2011 and 2012⁴ demonstrates that eagle activity is very low in the CCSM Project Site during early morning and late evening hours. In 42 hours of survey data collected prior to 8:00 AM in 2011 and 2012, only one eagle observation was recorded. This observation was recorded at 7:55 AM on August 18, 2011, substantially later than sunrise in any season. Similarly, very few eagle observations occurred during the hours surrounding sunset. During April to June 2011 and January to June 2012 (selected to represent periods representative of use during nesting activities), only 11 minutes of eagle use were recorded in nearly 55 hours of survey time after 5:00 PM. These minutes represent only 0.78% of all observed eagle activity in the CCSM project site during spring 2011 and spring 2012. Additionally, all

⁴ The 2012-2013 800m point-count data is not applicable to this analysis.

observed eagle activity occurred prior to 5:20 PM and before sunset. Because site-specific data shows low use before sunrise and after sunset, PCW believes there is scientific support for modifying the Service's recommended curtailment hours to begin at sunrise and end at sunset.

Nest Recommendation 8. *The Service recommends that PCW develop a specific monitoring program to determine and confirm nest activity to comply with Nest Recommendations 1 through 7. [recommended 07/24/13 (meeting notes)]*

PCW will adhere to the Services Nest Recommendation 8. PCW's Phase I ECP will describe a robust monitoring program to document nest activity each spring. If a nest is active, PCW will follow the Service's recommendations concerning seasonal curtailment, as set forth in this memorandum.

Areas of Concentrated Prey Resources (Recommendation C)

While areas of concentrated prey resources are not "important eagle-use areas" as defined in 50 CFR 22.3, the Service recommends that areas of concentrated prey resources should be avoided if they overlap or are adjacent to important eagle-use areas or areas the Service has identified as "project-specific eagle activity areas (e.g., areas for which sufficient data suggest high eagle activity)." PCW has conducted surveys of prey resources on the CCSM Project Site to identify prey resources of sufficient size and density that are also associated with eagle-use to identify those that may meet the Service's criteria for avoidance. Based on the results of these surveys, the Service has developed site-specific recommendations for avoidance of prey resources in the Phase I development area.

On August 10, 2012, the Service provided PCW with its initial recommendations regarding areas of concentrated prey resources.⁵ As part of its recommendations, the Service requested additional surveys to assist in the identification of prey resources on the CCSM Project Site. PCW provided the Service with the requested information on November 20, 2012. On May 3, 2013, after review of the prey resource data, the Service identified white-tailed prairie dogs (WTPD) as the most widespread prey resource on the CCSM Project Site and refined its recommendations to specifically focus on WTPD. On May 15, 2013, PCW and the Service met to discuss the implementation of the prey resource recommendations. The Service provided PCW with maps demonstrating how its recommendations could be implemented in the CCSM Project.

Concurrently with the development of the Service's recommendations, PCW conducted detailed wildlife surveys for the CCSM Project. The survey protocol included the identification and delineation of WTPD burrows and towns. PCW provided the site-specific data from the 2013 field surveys to the Service on September 6, 2013. Based on the 2013 survey data, the Service refined its recommendations and submitted new recommendations and implementation maps to PCW on October 1, 2013.

⁵ Only those recommendations that are applicable to the Phase I development are discussed in this memorandum.

The following list of prey resource recommendations has been compiled from the letters and maps provided by the Service, as described above. Each recommendation is followed by a discussion of how PCW has incorporated the recommendation in the Phase I wind turbine layout.

Prey Recommendation 1. *Previous studies came to different conclusions on prairie dog burrow densities in the project area. Determine current prairie dog activity, including burrow densities, following approved protocols, survey designs, and surveyor training. Ensure sampling effort provides adequate spatial coverage.* [recommended 08/10/12]

PCW has completed a full evaluation of potential prey resources as part of Stages 1 and 2 of the ECP Guidance process. In 2013, PCW completed pedestrian surveys of the Phase I development area to identify WTPD colonies. The boundaries of all WTPD colonies were delineated, activity was determined, and a relative burrow density was assigned to each colony. Using the WTPD data combined with eagle use data collected between 2011 and 2013, PCW identified those colonies that have the greatest potential for use by eagles. These areas were documented in PCW's 2012 Prey Base Assessment and the White-tailed Prairie Dog Survey Report and Eagle Use Assessment for Phase I of the Chokecherry and Sierra Madre Wind Energy Project submitted to the Service on September 6, 2013.

Prey Recommendation 2. *We recommend that turbines not be constructed in areas of concentrated prey resources unless it is demonstrated that the areas of concentrated prey resources do not overlap or are not immediately adjacent to other important eagle use areas (i.e., eagle nests, foraging areas, and communal roosts; 50 CFR 22.3), and where sufficient data are available to confirm that the concentrated prey resources are not in areas of project-specific eagle activity areas (e.g., areas for which sufficient data suggest high eagle activity).*

For CCSM, the areas of concentrated prey resources include white-tailed prairie dog towns. Turbines should not be placed in white-tailed prairie dog towns unless the towns do not overlap or are not immediately adjacent to eagle nests, other foraging areas, communal roosts, or project-specific eagle activity areas (e.g., areas for which sufficient data suggest high eagle activity). [recommended 05/03/13, detailed 5/15/13 (map 6), superseded by Prey Recommendation 3]

This recommendation has been superseded by the more site-specific recommendations on avoidance of concentrated prey resources included in Prey Recommendation 3. PCW has avoided turbine construction in areas of concentrated prey resources, as described in PCW's response to Prey Recommendation 3.

Prey Recommendation 3. *West of Rasmussen Lake is a relatively dense cluster of white-tailed prairie dog towns that collectively intersect at least eight eagle flight paths and that lie within a white-tailed prairie dog colony mapped by the Wyoming Game and Fish Department (WGFD). While the towns are not large individually (largest is 44.5 acres), due to their close proximity to each other they may collectively (317 acres) create a geographic*

unit with overall higher density of prey resources than adjoining areas, and therefore attract eagles and other raptors.

Other relatively large towns north of the cluster (487, 488 and 49) are separated from the group by more than two and a half times the average distance between the towns within the cluster (average = 353 meters). These three towns were not included in the cluster but will be treated separately due to their size and density of burrows. However, if the area between the cluster and the three towns was not surveyed in 2013 and if more towns are present, the cluster should be enlarged to include these towns.

One large town east of the cluster (2942) was not included, because it was inactive in 2013 and is about 0.5 kilometer from the group; however, including this town may be recommended as it could become reoccupied in the future. Finally, several small towns west of the cluster (485, 84, 3797, 3796, 3744, and 1728) were not included in the cluster, because of their small size and location outside of the WGFD polygon, and also due to inactivity at some towns and the lack of observed eagle flight paths. [recommended 10/01/13]

PCW has evaluated this recommendation and has made modifications to the preliminary Phase I wind turbine layout to accommodate the prey resources in the identified areas. While PCW's White-tailed Prairie Dog Survey Report and Eagle Use Assessment for Phase I of the CCSM Project did not identify any concentrated prey resources within the Phase I development area with demonstrated foraging activity by eagles that could be considered important eagle use areas, PCW developed measures to provide protection to eagles that may use these prey resources that are equivalent to those recommended by the Service.

The area included in Prey Recommendation 3 contains small, dispersed colonies of white-tailed prairie dogs. The Service's recommendation cites that eight eagle flight paths intersect in this area of white-tailed prairie dog activity. However, the Service did not consider the amount of survey time associated with those observations. Observations of eagle use in the area of white-tailed prairie dog activity were recorded from three monitoring locations (RM13, RM20, and RM17). Between 2011 and 2012, more than 160 hours of survey were completed at these three locations during the period in which white-tailed prairie dogs are available as potential prey (April through October). Eight flight paths recorded in 160 hours of survey time does not represent consistent use that would indicate an important foraging area. No observed eagle foraging behavior has been documented in this area. The majority of documented eagle use in this area occurs in the northern half of the Service's recommended avoidance area and consists of direct and powered flight with some soaring behavior.

Based on this site-specific information, PCW has removed the northern turbine row and the easternmost turbines from the central row, a total of 16 turbines, from the preliminary Phase I wind turbine layout (Figure 4). This results in removal of turbines from an area of approximately 3,500 acres. The exclusion of these turbines avoids the largest concentration of the densest WTPD colonies and eagle use areas and provides a 0.5 to 1.5 mile wide corridor between the Miller Hill Turbine No-Build Area and the Rasmussen Reservoir Turbine No-Build Area and Sage-Grouse Core Areas. When combined with

the measures PCW has implemented to respond to BBCS Recommendation 1, this measure provides equal or greater protection for eagles than Prey Recommendation 3. *See attached Figure 4 – Sierra Madre Avoidance and Minimization Measures*

Other Project-specific Eagle Activity Areas (Recommendation D)

In addition to important eagle-use areas, the Service provided recommended avoidance areas referred to as “other project-specific eagle activity areas.” The Service states that “although project-specific, these other project-specific eagle activity areas are typically used by eagles; therefore, it is appropriate to identify these areas and provide buffer recommendations for them.”

The concept of other project-specific eagle activity areas was first introduced in the recommendation letter provided by the Service on May 3, 2013. At the May 15, 2013, meeting, the Service provided maps to PCW demonstrating how their recommendations might be implemented in the CCSM Project. Following discussion of the May 3, 2013, recommendations and the collection of additional eagle use data, on July 24, 2013, the Service presented an updated map demonstrating the implementation of the project-specific eagle activity areas recommendations, along with a verbal explanation of the areas identified on the map.

The following list of other project-specific eagle activity area recommendations has been compiled from the letters, maps and guidance provided by the Service, as described above. Each recommendation is followed by a discussion of how PCW has incorporated the recommendation in the Phase I wind turbine layout.

Use Recommendation 1. *We recommend applying buffers for other project-specific eagle activity areas identified by survey data (e.g., 800-meter point counts). These are different than “important eagle use areas” (as defined in regulations and the ECPG 2013, p. 35) which are limited to nests, foraging areas, and communal roost sites. Other project-specific eagle activity areas include migration corridors, migration concentration sites, stopover sites, perches, specific areas where eagles gain uplift for foraging and other movements, movement corridors, etc. They include all types of eagle use areas except the “important eagle use areas.” Although project-specific, these other project-specific eagle activity areas are typically used by eagles; therefore, it is appropriate to identify these areas and provide buffer recommendations for them. In applying this recommendation, we will focus on areas where there is an intersection of geographic relief (e.g., cliff features used for nesting, ridge features used for migration, rims used for orthographic lift) and documented project-specific eagle activity areas. Furthermore, the recommended buffers for geographic features would vary based on the value and use of those features by eagles, with those having greater value and use by eagles receiving larger buffers. [recommended 05/03/13, detailed 5/15/13 (map 7), revised 7/24/13 (map 3), superseded by Use Recommendations 2 through 6]*

Use Recommendation 1 was largely superseded by the Service’s July 24, 2013, site-specific recommendations for avoidance of “other project-specific eagle activity areas”, Use Recommendations 2 through 6. Please refer to PCW’s response to Use Recommendations 2 through 6 for information on how Use Recommendation 1 was implemented.

Use Recommendation 2. *The Service recommends a 100 m setback from the rim of Miller Hill.* [recommended 07/24/13 (map 3)]

PCW's understands that this recommendation is intended to minimize risks to eagles that could use the Miller Hill Rim for soaring and kiting behaviors. PCW has collected extensive data on the wind resource on the CCSM Project Site. Winds in the CCSM Project Site are from the west and southwest for as much as 75% of the time, as demonstrated on the attached wind rose from meteorological tower Sierra Madre 13 located on Miller Hill (Figure 7).⁶ Since Miller Hill faces to the east and northeast, downdraft conditions are commonly created along the Miller Hill Rim. Because of the strong directionality of the winds in the CCSM Project Site and the predominantly downdraft conditions, Miller Hill Rim does not provide regular soaring and kiting opportunities for eagles and other raptors. However, a 100m setback does provide protection for birds that might use the Miller Hill Rim during low wind conditions or infrequently when winds are from the east and northeast.

Use Recommendation 2 has been applied to the Phase I wind turbine layout as shown in Figure 4. Implementing this recommendation resulted in the removal of 9 turbines from the preliminary wind turbine layout. In addition, while removing and rearranging the Phase I wind turbine layout to accommodate this recommendation, the bases of the wind turbines were generally moved farther than 100m from Miller Hill Rim; therefore this measure is consistent with Use Recommendation 2. *See attached Figure 4 – Sierra Madre Avoidance and Minimization Measures*

Use Recommendation 3. *The Service recommends a 300m setback from the rim of Miller Hill to coincide with an eagle use area and to buffer a topographic feature.* [recommended 07/24/13 (map 3)]

The Service recommended a 300 meter setback from the Miller Hill Rim for turbines located within approximately 1,000 meters north and 1,300 meters south of County Road 505W (Miller Hill Road) in the Upper Miller Hill turbine development area. PCW's understanding is that this recommendation is intended to minimize risks to eagles that could use this portion of the Miller Hill Rim for soaring and kiting behaviors. As described in Use Recommendation 2, Miller Hill Rim does not provide regular soaring and kiting opportunities. Additionally, analysis of flight paths collected between 2011 and 2013 indicate that eagles generally fly perpendicular with the Miller Hill Rim in this area. This indicates that a 300-meter setback will likely provide no additional protection for eagles above and beyond the 100m setback adopted in Use Recommendation 2.

PCW has developed an alternate strategy to avoid and minimize risks to eagles in the area identified in Use Recommendation 3. Based on the eagle use data in this area, PCW has removed 4 turbines that were in the preliminary Phase I wind turbine layout (3

⁶ See Figure 1 for the location of the Sierra Madre 13 meteorological tower.

immediately north of County Road 505W and 1 approximately 1200m south of County Road 505W) and has set one turbine back approximately 270m from Miller Hill Rim (Figure 4). The removal and setback of these turbines avoids impacts to eagles in an area with documented use and provides the protection intended by the Service with the 300 meter setback because it removes turbines and expands the flight corridor in this area when combined with the measures adopted for Use Recommendation 4. This measure provides equal or greater protection to eagles and non-eagle raptors as it removes many of the highest risk turbines and expands the avoidance areas described in Use Recommendation 4. *See attached Figure 4 – Sierra Madre Avoidance and Minimization Measures*

Use Recommendation 4. *The Service recommends placing a 300-meter buffer around west and southwest facing slopes in the McKinney Creek headwaters roughly adjacent to County Road 505W (Miller Hill Road) in the Upper Miller Hill Phase I development area. [recommended 07/24/13 (map 3)]*

Eagle flight paths in the area are roughly perpendicular with Miller Hill Rim and consist of direct powered flight indicating that eagles are using the predominant westerly and southwesterly wind directions to move through the area. Eagle use data does not indicate that eagles are using this area for soaring and kiting behaviors; however, after review of the eagle use data, PCW has removed 6 turbines from the preliminary Phase I turbine layout in this area to maintain a movement corridor for eagles (Figure 4). When combined with the measures described in PCW's response to Use Recommendation 3, the removal of these turbines creates a 0.75 to 1 mile wide movement corridor that provides a connection to undeveloped portions of Miller Hill, the Miller Hill Turbine No-Build Area, and the other avoidance areas PCW designated in response to Use Recommendations 2 through 6. *See attached Figure 4 – Sierra Madre Avoidance and Minimization Measures*

Use Recommendation 5. *The Service recommends placing a 300-meter buffer around west and southwest facing slopes immediately adjacent the RM14 raptor monitoring location in the Lower Miller Hill Phase I development area. [recommended 07/24/13 (map 3)]*

Between 2011 and 2013, PCW completed raptor monitoring at multiple locations throughout the CCSM Project Site. Raptor Monitoring site 14 (RM14) was monitored for the majority of the survey period and was documented as having consistent use by eagles and non-eagle raptors. Eagle use in this area indicates that the slopes surrounding the monitoring site could be used by eagles and non-eagle raptors for soaring and kiting activities. PCW has incorporated this recommendation into the Phase I wind turbine layout (Figure 4).

Use Recommendation 6. *The Service recommends placing a 300-meter buffer around slopes immediately adjacent to the RM13 raptor monitoring location in the Lower Miller Hill Phase I development area. [recommended 07/24/13 (map 3)]*

Between 2011 and 2013, PCW completed raptor monitoring at multiple locations throughout the CCSM Project site. Raptor Monitoring site 13 (RM13) was monitored in

2011 and areas adjacent to RM13 were monitored during 2012 and 2013. Eagle use in this area indicates that the slopes surrounding the monitoring site could be used by eagles and non-eagle raptors for soaring and kiting activities. PCW has incorporated this recommendation into the Phase I wind turbine layout (Figure 4).

Miller Hill

On August 10, 2012, the Service provided its initial recommendations regarding the Miller Hill area of the CCSM Project. These recommendations have largely been superseded or incorporated into the Service's subsequent recommendations as described below; however, PCW has described each recommendation and how it has been applied to the Phase I wind turbine layout for reference.

Miller Hill Recommendation 1. *Based on eagle exposure rates, RM14 had the third highest eagle use (similar to that of the Interior Rim) of all 15 eagle/raptor point count locations, and RM13 had the fourth highest use. Both of these points occur on the eastern side of the proposed avoidance area, suggesting additional survey data are needed in this location. We will provide survey recommendations in the near future. [recommended 08/10/12, superseded by Use Recommendations 5 and 6]*

Refer to PCW's response to Use Recommendations 5 and 6.

Miller Hill Recommendation 2. *At least one study reported high density prairie dog colonies and towns occur on the western side of Miller Hill. Eagle flight path data on this side suggest lower eagle use than on the eastern side; however, additional survey data are also needed for this area due to potential high density prey base, and the presence of sage-grouse that are also prey items for golden eagles. We will provide survey recommendations in the near future. [recommended 08/10/12, superseded by Prey Recommendation 3]*

Refer to PCW's response to Prey Recommendation 3 and BBCS Recommendations 1 and 2.

Miller Hill Recommendation 3. *Monitor GOEA nest #162 at SW corner of Sierra Madre. If active in 2013, determine activity patterns of the eagles including flight paths, foraging locations, and roosts, and continue monitoring activity of the adults and fledglings. [recommended 08/10/12]*

Nest 162 was not active in 2012 or 2013. Refer to PCW's response to Nest Recommendations 1 through 8.

Miller Hill Recommendation 4. *In evaluating eagle use on the western side of Miller Hill (and at nest #162), monitor eagle use patterns at and near the greater sage-grouse leks, particularly while grouse are on leks. [recommended 08/10/12]*

PCW has collected more than four years of data related to greater sage-grouse use in the CCSM Project Site. Eagle use patterns at or near greater sage-grouse leks do not indicate that these locations are important for eagle foraging; therefore, these locations do not

represent important eagle use areas. PCW's 2012 Prey Base Assessment Report describes in detail observed eagle use associated with lek locations.

Miller Hill Recommendation 5. *Determine if golden eagles are moving between Miller Hill and Rasmussen Reservoir in search of prey, particularly during the fall when prairie dog numbers decline and waterfowl and coot numbers increase. [recommended 08/10/12]*

Some possibility exists for movement between Miller Hill and Rasmussen Reservoir. To address Miller Hill Recommendation 5, PCW has removed two full rows of turbines and has partially removed a third row of turbines from the preliminary Phase I turbine layout (refer to PCW's responses to Prey Recommendations 1 through 3, BBCS Recommendation 1 and Figure 4) and has established 300 meter buffers surrounding slopes adjacent to monitoring locations RM13 and RM14 (refer to PCW's response to Use Recommendations 5 and 6).

Non-eagle Raptors

On October 1, 2013, the Service recommended two areas to avoid for the benefit of non-eagle raptors based on the prey resource survey data for the CCSM Project. While the Service acknowledges that these areas are not associated with eagle use areas or flight paths, it states that the areas "may attract eagles and other raptors" and that PCW should consider incorporating these avoidance areas into the Bird and Bat Conservation Strategy (BBCS) for the CCSM Project. PCW has reviewed the site-specific data and the Service's recommendations for non-eagle raptors. PCW has identified alternate approaches to implement the Service's recommendations in the Phase I wind turbine layout. PCW believes that these alternate implementation strategies provide the protection the Service seeks in its recommendations.

BBCS Recommendation 1. *South – West of Rasmussen Lake are three relatively large white-tailed prairie dog towns with high density of burrows/animals (487, 488 and 49). As discussed previously, these three towns are separated from the cluster in A [refers to the area identified in Prey Recommendation 3] by more than two and a half times the average distance between the towns in the cluster. Other data, such as observed eagle flight paths, do not strongly suggest these towns are heavily used by eagles as foraging locations. However, compared to other towns, these are relatively large with a high burrow density, suggesting that white-tailed prairie dogs might be locally abundant and may attract eagles and other raptors. The recommendation is to buffer these three towns by 120 meters (396 feet), the approximate height of the "typical" wind turbine. [recommended 10/01/13]*

The Service developed BBCS Recommendation 1 to protect a prey resource area that "may attract eagles and other raptors." PCW has evaluated this recommendation and has proposed alternate measures to the preliminary Phase I wind turbine layout to protect eagles and other raptors that may be attracted to the identified prey resource.

PCW's White-tailed Prairie Dog Survey Report and Eagle Use Assessment for Phase I of the Chokecherry and Sierra Madre Wind Energy Project did not identify any concentrated prey resources within the Phase I development area that are also important eagle use areas; however, based on the concern expressed by the Service, PCW evaluated the site-specific information and removed the row of turbines immediately north of the colony

located approximately 0.9 miles west of County Road 401 from the preliminary Phase I wind turbine layout (Figure 4). Removal of this row of turbines provides a 1 to 1.25 mile wide corridor connecting the Miller Hill Turbine No-Build Area and the Rasmussen Reservoir Turbine No-Build Area. Removal of these turbines preserves the existing prey resource and provides additional connectivity between the Turbine No-Build Areas. In combination with PCW's response to the Prey Recommendations, these measures provide the protections for eagles and non-raptors the Service requested in BBCS Recommendation 1.

BBCS Recommendation 2. *North – The north side of lower Miller Hill contains some of the largest and most dense white-tailed prairie dog towns mapped in 2013, with a total area of about 1 square mile (Table 2). While no demonstrated important eagle use areas or multiple eagle flight paths overlap these towns, we recommend this area be included in avoidance and minimization under the Bird and Bat Conservation Strategy (BBCS) to protect other raptors. In addition, ACPs could be developed for eagles. Measures might include: (1) turbine removal, (2) seasonal curtailment, and (3) additional study to determine how the area is used by raptors and eagles. The 120-meter buffer is based on the height of a “typical” wind turbine. [recommended 10/01/13]*

The Service's recommendation is designed to “protect other raptors.” Avian surveys were conducted in this area from 2011 to 2013. Nearly 138 hours of observation occurred in this area during 2011 through 2012 long-watch surveys. An additional 19 hours of survey occurred in this area as part of the 2012 through 2013 800-meter point count surveys. During 157 hours of survey, only five raptors (two northern harriers, one merlin, one ferruginous hawk, and one Swainson's hawk) were documented in the vicinity of these prairie dog colonies. No eagle observations occurred in this area. Of these observations, only the Swainson's hawk and ferruginous hawk are likely to regularly prey on white-tailed prairie dogs. Due to the very low use of the area by “other raptors,” this recommendation will provide little benefit to raptor species compared with other recommendations made by the Service and the conservation measures identified in PCW's response to BBCS Recommendation 1; therefore, the Phase I wind turbine layout does not avoid the area identified in BBCS Recommendation 2. *See attached Figure 4 – Sierra Madre Avoidance and Minimization Measures*

Conclusion

PCW has worked closely with the Service to develop measures to avoid and minimize impacts to bald and golden eagles. PCW's designated Turbine No-Build Areas avoid placement of turbines in identified important eagle use areas and provide flight corridors between those areas. Additionally, the comprehensive measures described in this memorandum avoid or minimize risks in important eagle use areas as well as other areas commonly used by eagles and other raptors including topographic features, prey resources, and movement corridors.

All the avoidance and minimization measures PCW is implementing are based on site-specific data collected over a four year period using protocols developed in coordination with the Service and in compliance with the ECP Guidance and WEG Guidance. In developing the Phase I wind turbine layout, PCW has incorporated and applied the Service's recommended avoidance and minimization measures as discussed in detail above. As a result, the Phase I wind turbine layout

complies with the ECP and WEG Guidance and represents the culmination of an iterative approach to siting and site characterization consistent with Stages 1 and 2 of the ECP Guidance and Tiers 1 through 3 of the WEG Guidance. The resulting Phase I wind turbine layout, when combined with approved or experimental Advanced Conservation Practices avoids and minimizes impacts to bald and golden eagles such that additional take is unavoidable.

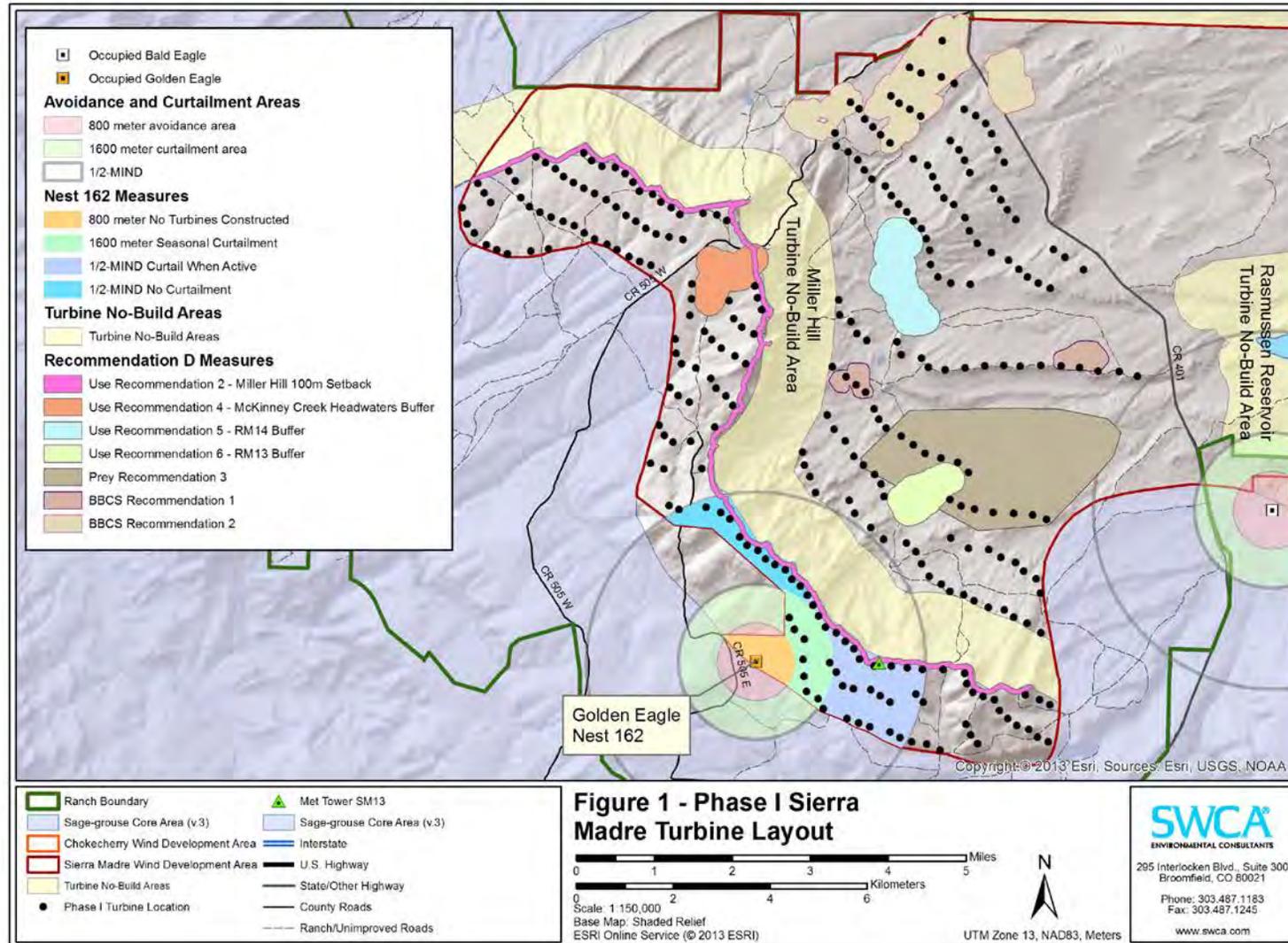
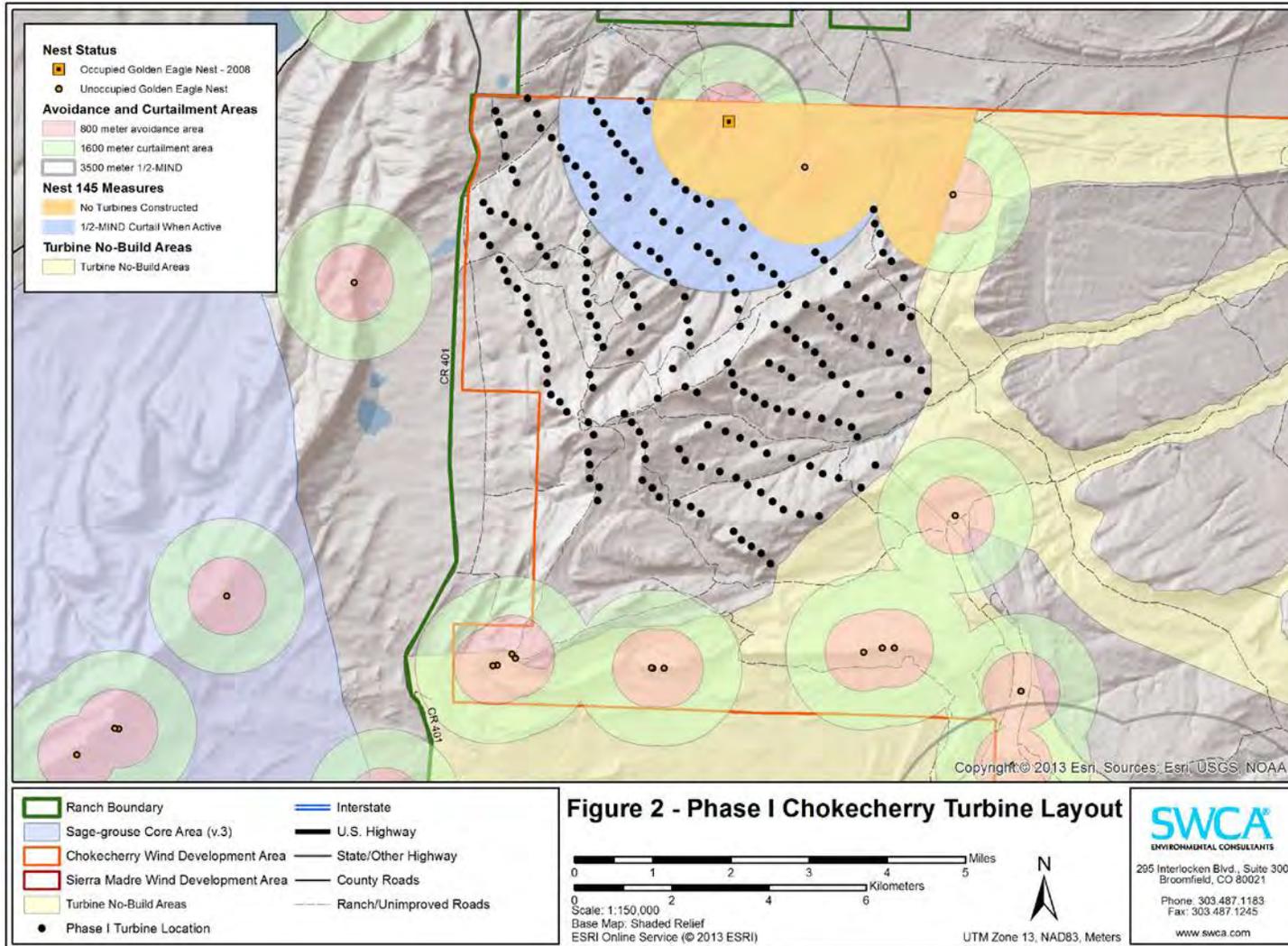
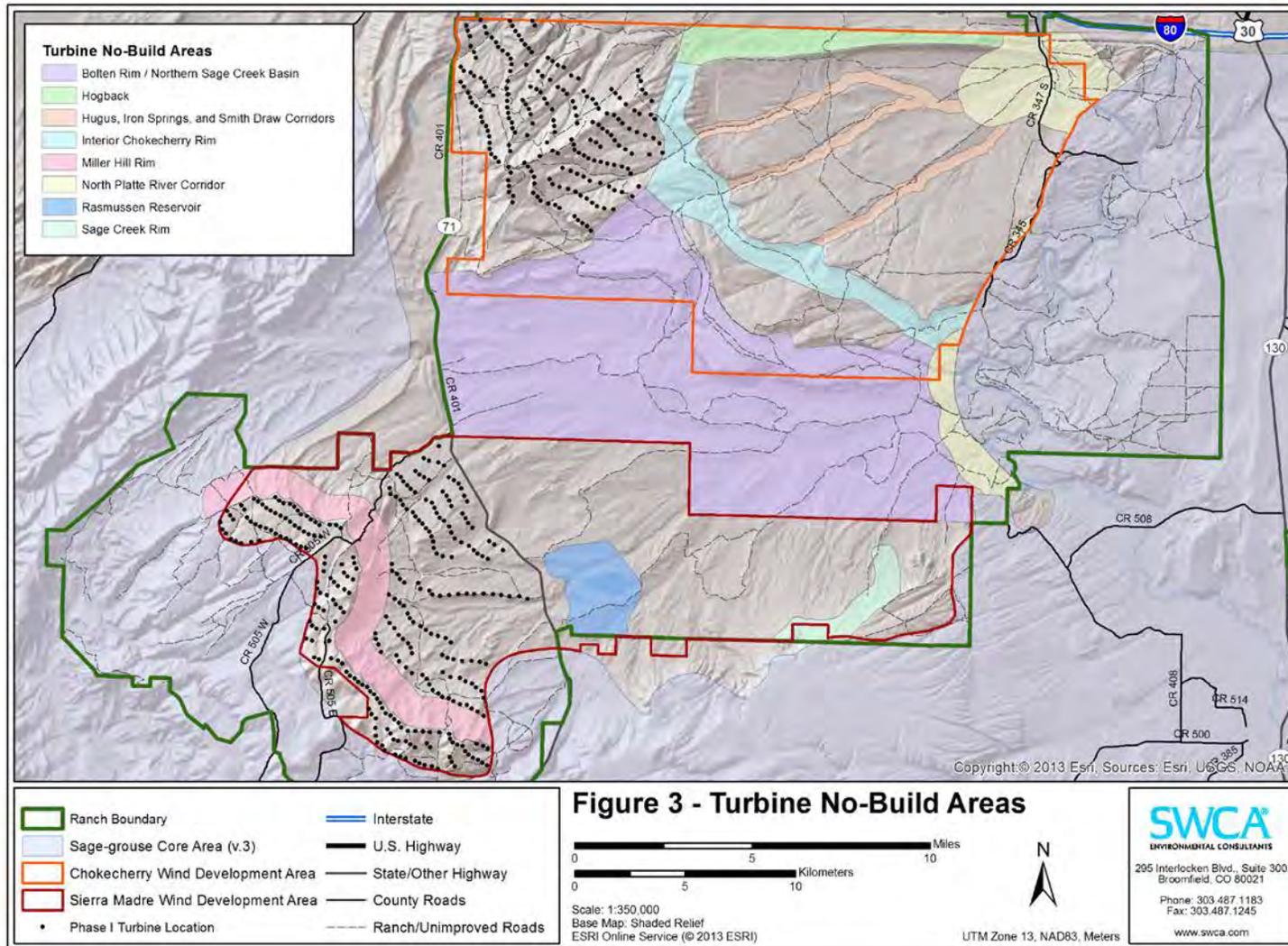
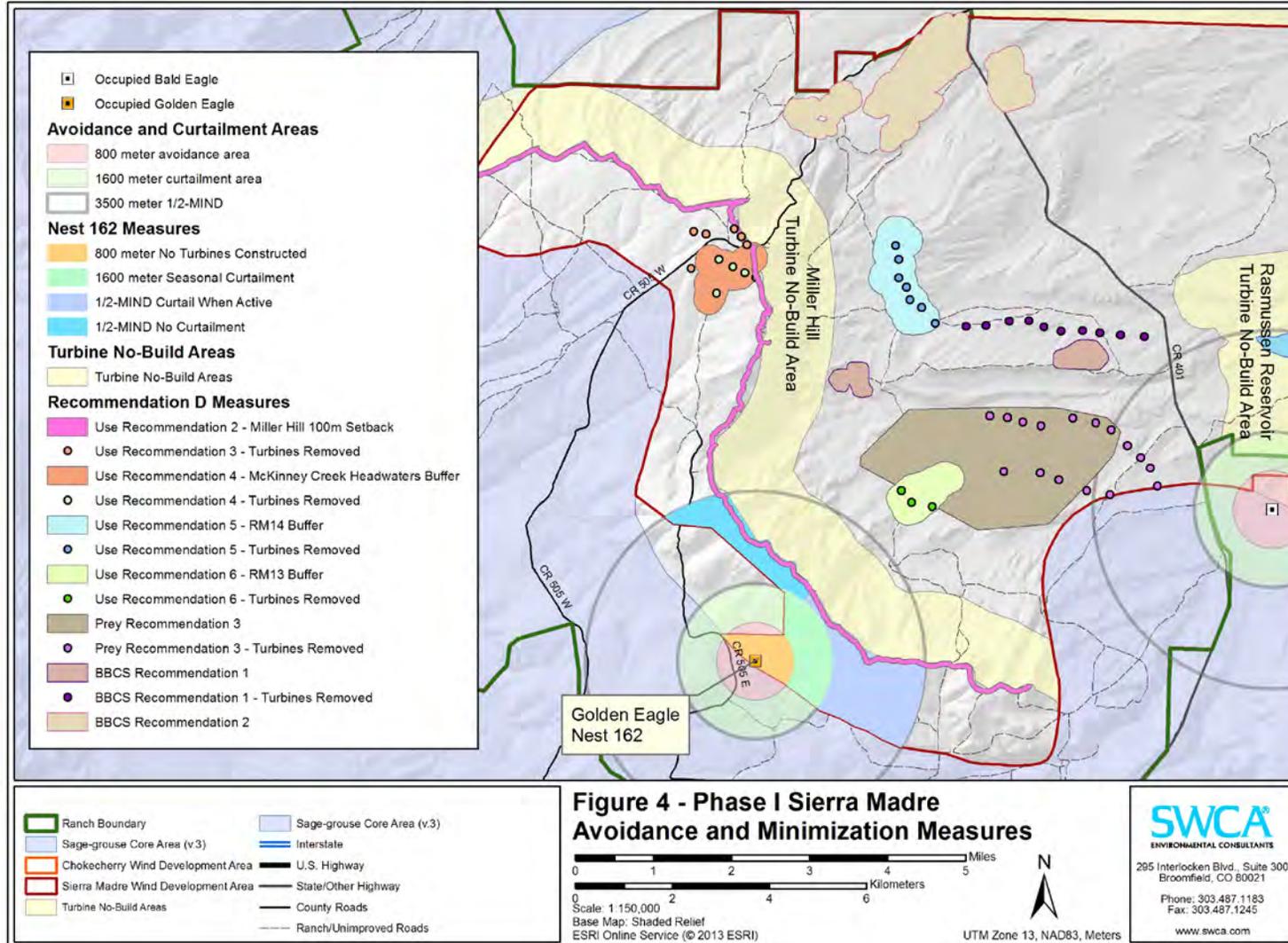
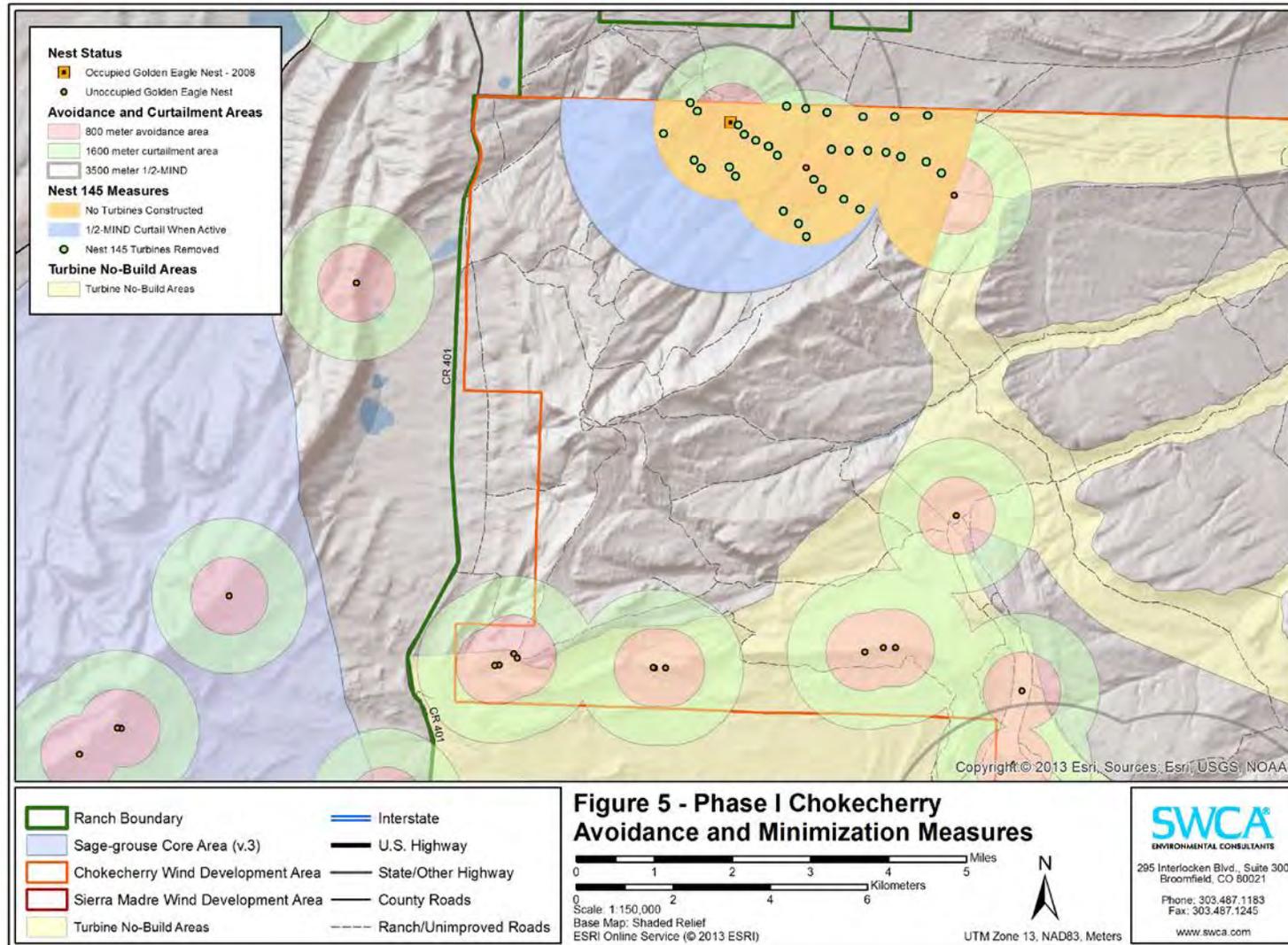


Figure 1 - Phase I Sierra Madre Turbine Layout









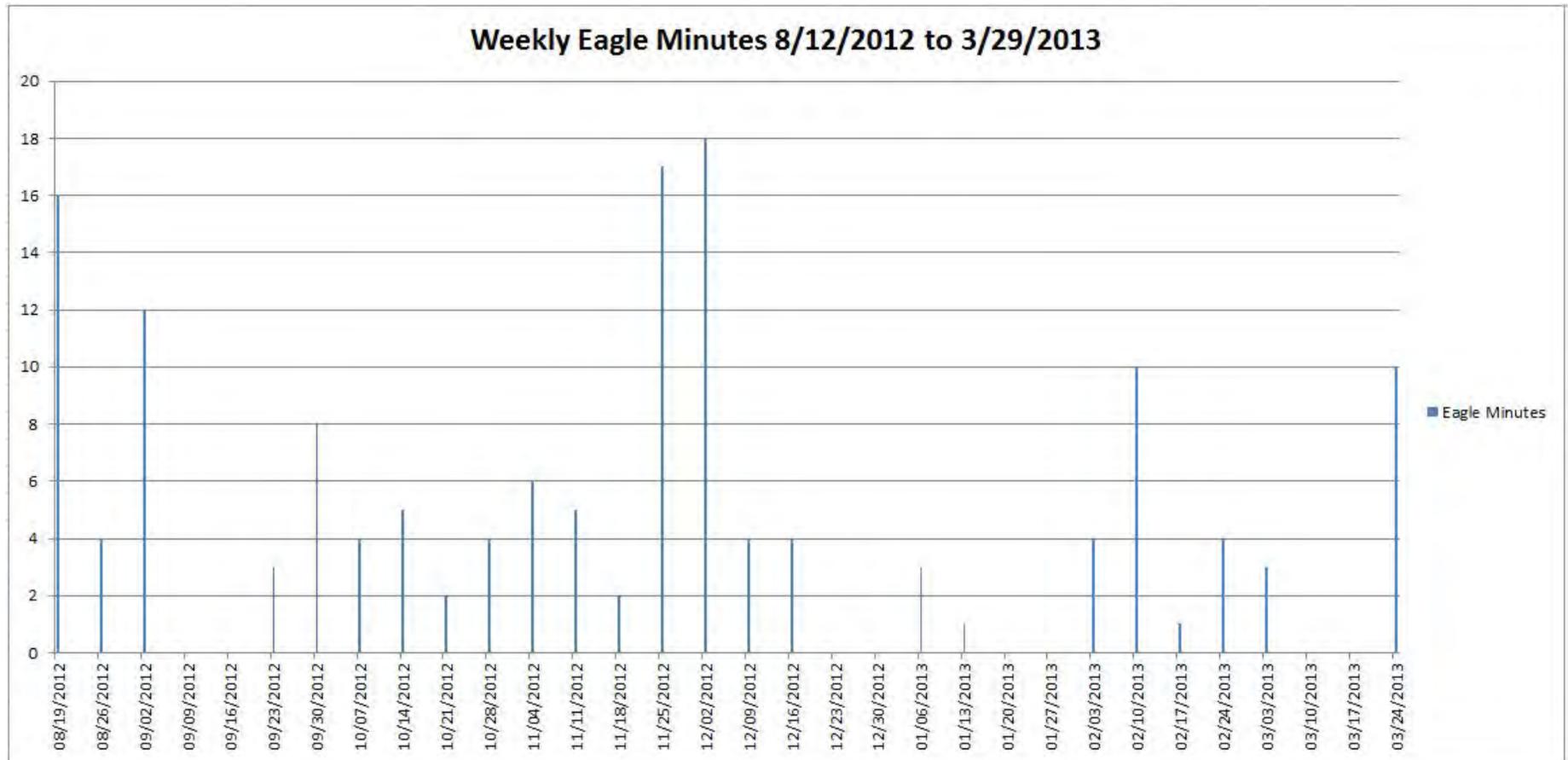


Figure 6. Summary of eagle flight minutes between August 2012 and March 2013. The Y-axis represents the number of minutes of observed eagle use recorded during each week’s survey efforts. Approximately 30 hours of survey occurred each week during this period.

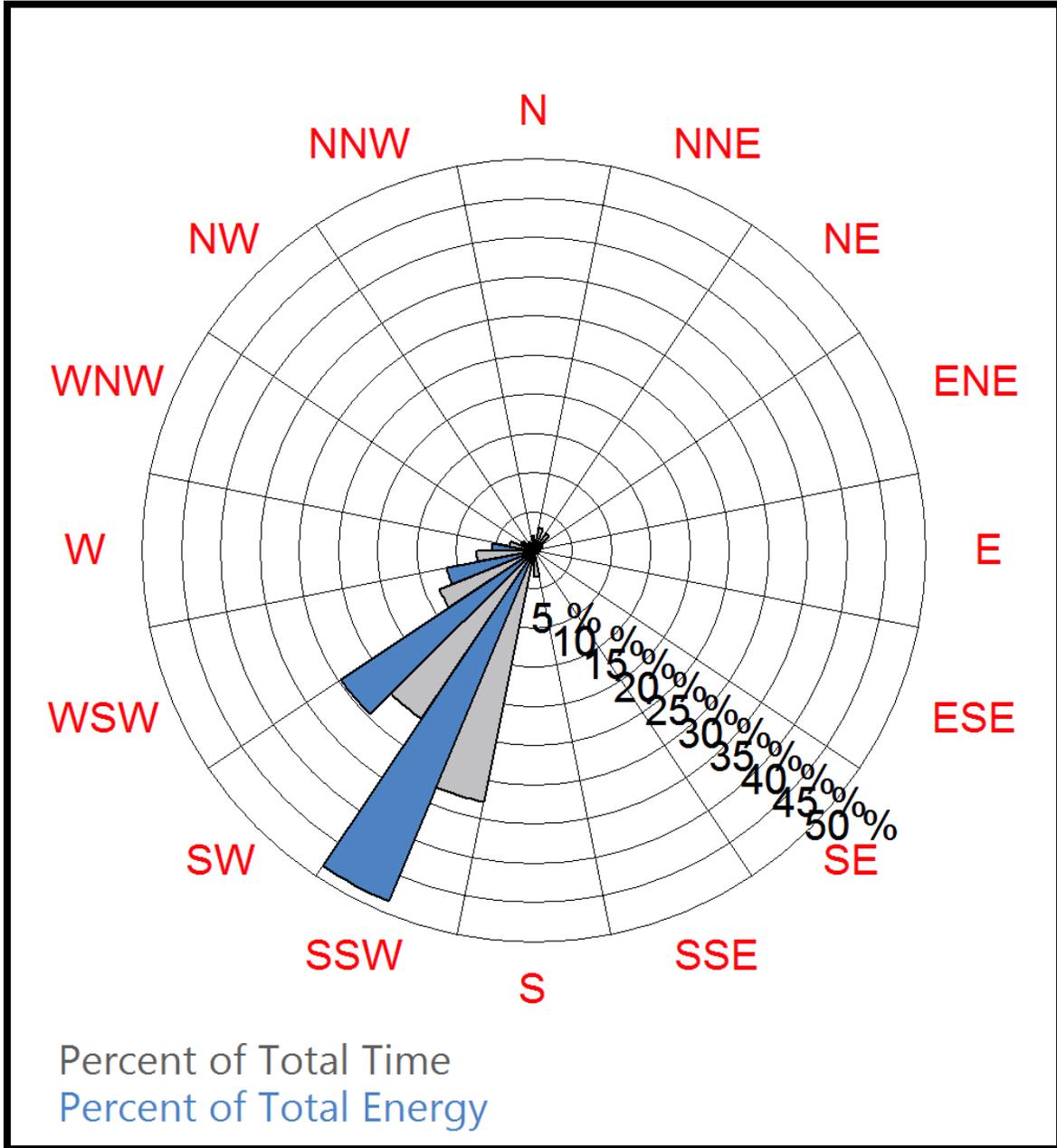


Figure 7. Annual Wind Rose for Meteorological Tower "Sierra Madre 13"



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MEMORANDUM

BY ELECTRONIC MAIL

TO: U.S. Fish and Wildlife Service

DATE: January 22, 2014

RE: Revisions to CCSM Project Phase I Wind Turbine layout in response to the Service's eagle avoidance and minimization recommendations made on December 5, 2013

Power Company of Wyoming LLC (PCW) and the U.S Fish and Wildlife Service (Service) continue to work cooperatively to identify eagle avoidance and minimization measures for Phase I of the Chokecherry and Sierra Madre Wind Energy Project (CCSM Project). PCW and the Service met on December 5, 2013, to discuss the CCSM Project Phase I wind turbine layout submitted by PCW on November 26, 2013. This memorandum outlines the recommendations made by the Service on December 5, 2013, and provides a revised Phase I wind turbine layout that complies with these recommendations (Figures 1 and 2).

Previously, on November 26, 2013, PCW provided the Service with the Phase I wind turbine layout and a memorandum discussing the layout's compliance with the Service's recommended eagle avoidance and minimization measures. In the memorandum, PCW compiled the various eagle avoidance and minimization measures recommended by the Service over the course of the CCSM Project review and gave each recommendation a specific designation. For ease of reference, this memorandum relies upon the designations used in the November 26, 2013, memorandum.

At the meeting on December 5, 2013, PCW and the Service discussed the Service's review of the November 26, 2013, memorandum and Phase I wind turbine layout and PCW's implementation of the recommended eagle avoidance and minimization measures. The Service agreed that PCW's compilation of the Service's recommendations was accurate. Therefore, the discussion focused on areas outlined in the November 26, 2013, memorandum where PCW identified an alternate approach to implementing the Service's recommendations. This memorandum addresses the recommendations discussed at the December 5, 2013, meeting and any subsequent modifications the Service and PCW agreed to with respect to either the implementation strategies or the Phase I wind turbine layout.

RECOMMENDATIONS

Nest Recommendation 2

Recommendation: We recommend that turbines not be constructed within 800 meters (0.5 mile) of any unoccupied (historic) golden eagle nest, and that all turbines between 800 meters and 1,600 meters (1.0 mile) of any unoccupied nest are curtailed during each year starting 15 January until 1 May, or until adequate nest surveys demonstrate that the nests are unoccupied. Further, if the nest becomes occupied, turbines within the ½-MIND of the nest should be curtailed during the breeding season until the young fledge and are no longer dependent on the nest or until the nest becomes unoccupied. [recommended 05/03/13, detailed 05/15/13 (map 5)]

Update: Nest Recommendation 2 will be implemented as described by PCW in the November 26, 2013 memorandum. The site-specific data and analysis for the CCSM Project demonstrate that eagle use is very low during January and early February; therefore, PCW will curtail turbines located within 1,600 meters of an unoccupied golden eagle nest between February 1 and April 30 or until nest activity is determined. (This modification to the recommended seasonal curtailment period also applies to Nest Recommendations 3 and 4)

Nest Recommendation 3

Recommendation: Add avoidance area around GOEA nest #162 at SW corner of Sierra Madre. [recommended 08/10/12, updated 05/15/13 (map 1), 07/24/13 (map 3), and 12/05/13]

Update: In addition to the eagle avoidance and minimization measures for nest #162 described in the November 26, 2013 memorandum, the Service recommended that PCW seasonally curtail nine turbines along Miller Hill rim outside of the 1600 meter curtailment area while the nest is occupied. If the nest becomes unoccupied, as defined in the May 3, 2013 letter from the Service, the nine additional turbines along Miller Hill rim would no longer be curtailed and the nest would be treated like other unoccupied nests under Nest Recommendation 2 above. PCW agrees to comply with this updated recommendation and will apply the measures shown on Figure 3 to nest #162.

Nest Recommendation 7

Recommendation: The Service clarified that curtailment, as contemplated in Nest Recommendations 1 through 5, only applies during daylight hours when eagles are active. The Service further indicated that it defines daylight hours as ½ hour before sunrise to ½ hour after sunset in the absence of site-specific data. [recommended 07/24/13 (meeting notes)]

Update: Nest Recommendation 7 will be implemented as described in the November 26, 2013 memorandum. The site-specific data and analysis for the CCSM Project demonstrate that eagle activity is very low during early morning and late evening hours; therefore, turbines subject to curtailment under Nest Recommendations 1 through 5 will be curtailed during daylight hours (sunrise to sunset).

Prey Recommendation 3

Recommendation: West of Rasmussen Lake is a relatively dense cluster of white-tailed prairie dog towns that collectively intersect at least eight eagle flight paths and that lie within a white-tailed prairie dog colony mapped by the Wyoming Game and Fish Department (WGFD). While the towns are not large individually (largest is 44.5 acres), due to their close proximity to each other they may collectively (317 acres) create a geographic unit with overall higher density of prey resources than adjoining areas, and therefore attract eagles and other raptors.

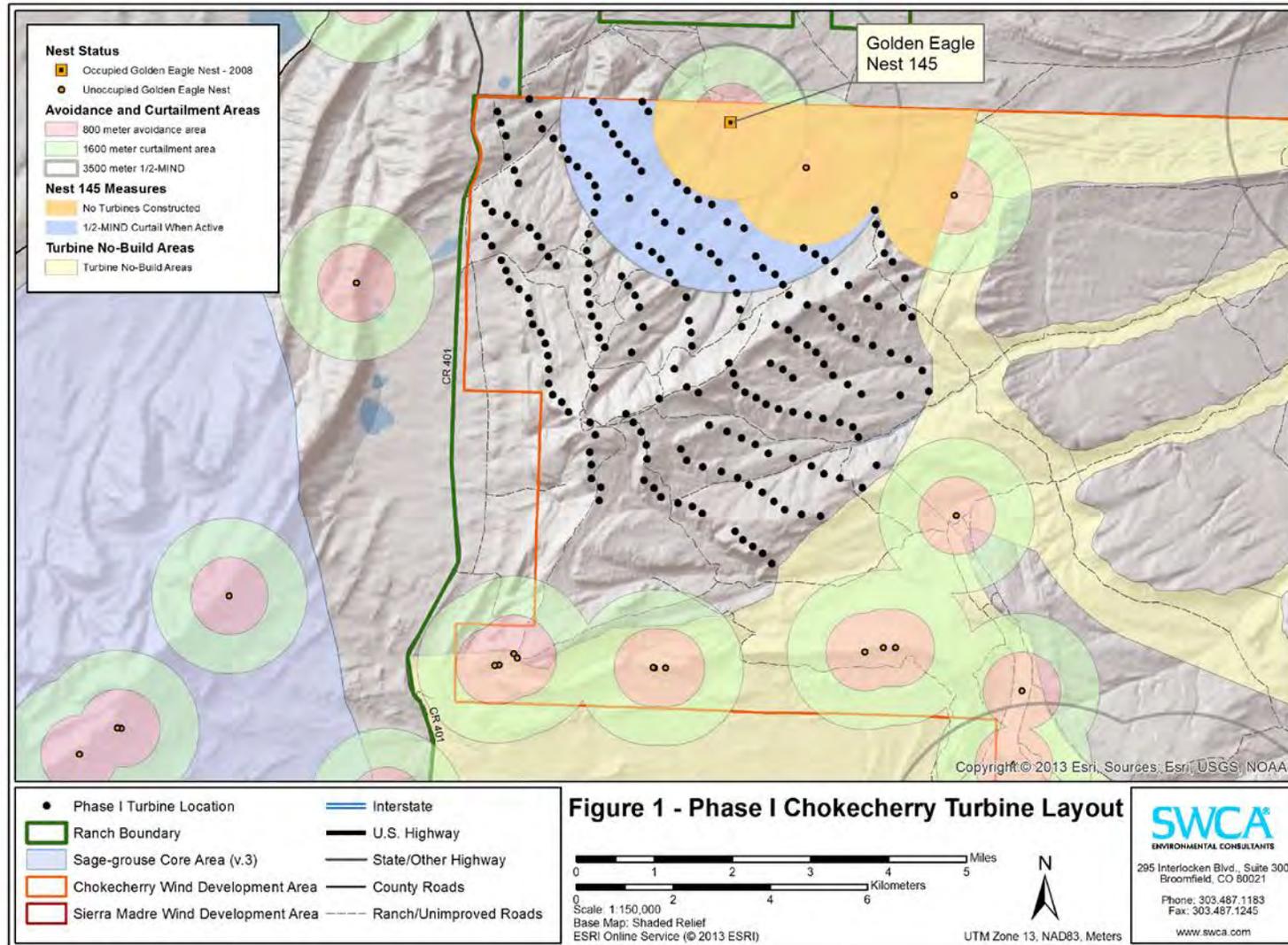
Other relatively large towns north of the cluster (487, 488 and 49) are separated from the group by more than two and a half times the average distance between the towns within the cluster (average = 353 meters). These three towns were not included in the cluster but will be treated separately due to their size and density of burrows. However, if the area between the cluster and the three towns was not surveyed in 2013 and if more towns are present, the cluster should be enlarged to include these towns.

One large town east of the cluster (2942) was not included, because it was inactive in 2013 and is about 0.5 kilometer from the group; however, including this town may be recommended as it could become reoccupied in the future. Finally, several small towns west of the cluster (485, 84, 3797, 3796, 3744, and 1728) were not included in the cluster, because of their small size and location outside of the WGFD polygon, and also due to inactivity at some towns and the lack of observed eagle flight paths. [recommended 10/01/13]

Update: Based on recommendations made by the Service in the December 5, 2013 meeting on the implementation of Prey Recommendation 3, PCW modified the November 26, 2013 Phase I wind turbine layout. As shown on Figures 4 and 5, ten turbines were relocated to other portions of the Phase I wind development area. Seven turbines along the southern boundary of the Prey Recommendation 3 area remain in the Phase I wind turbine layout based on the site-specific data that show a lack of observed eagle use surrounding those turbine locations. The lack of observed eagle use in the southern portion of the Prey Recommendation 3 area indicates that the area is not an “important eagle-use area” or a “project-specific eagle activity area” and therefore does not meet the Service’s criteria for avoidance. (This modification to the implementation of Prey Recommendation 3 does not affect compliance with Miller Hill Recommendations 2 and 5 as described in the November 26, 2013 letter.)

CONCLUSION

The Phase I wind turbine layout shown in Figures 1 and 2 complies with the eagle avoidance and minimization recommendations made by the Service, as set forth in the November 26, 2013, memorandum from PCW to the Service and as updated following the meeting on December 5, 2013. The layout reflects the measures recommended by the Service and implemented by PCW to avoid and minimize impacts to bald and golden eagles to the extent practicable such that that additional take is unavoidable, consistent with the ECP Guidance, Wind Energy Guidelines, and the provisions of the Bald and Golden Eagle Protection Act.



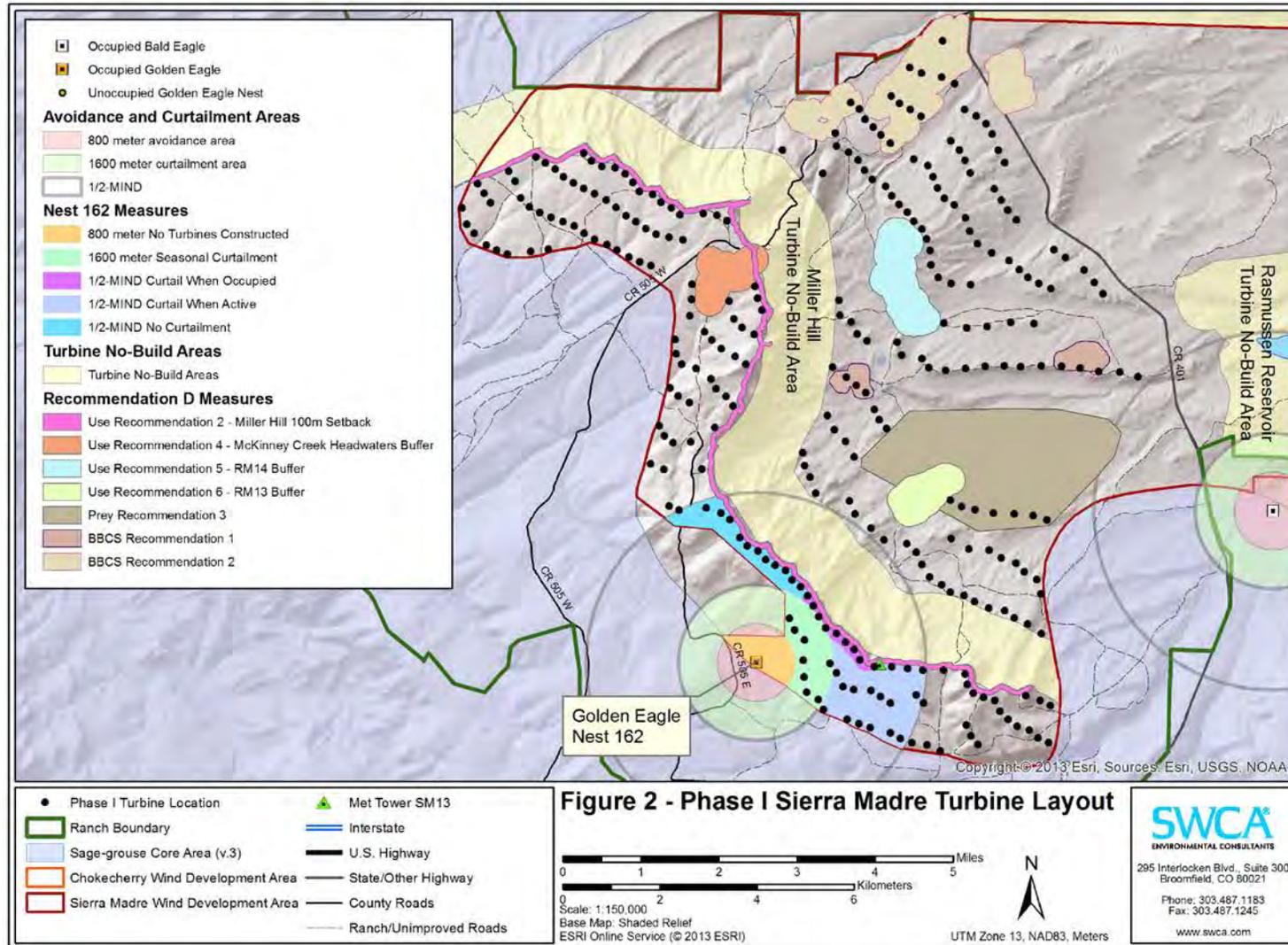
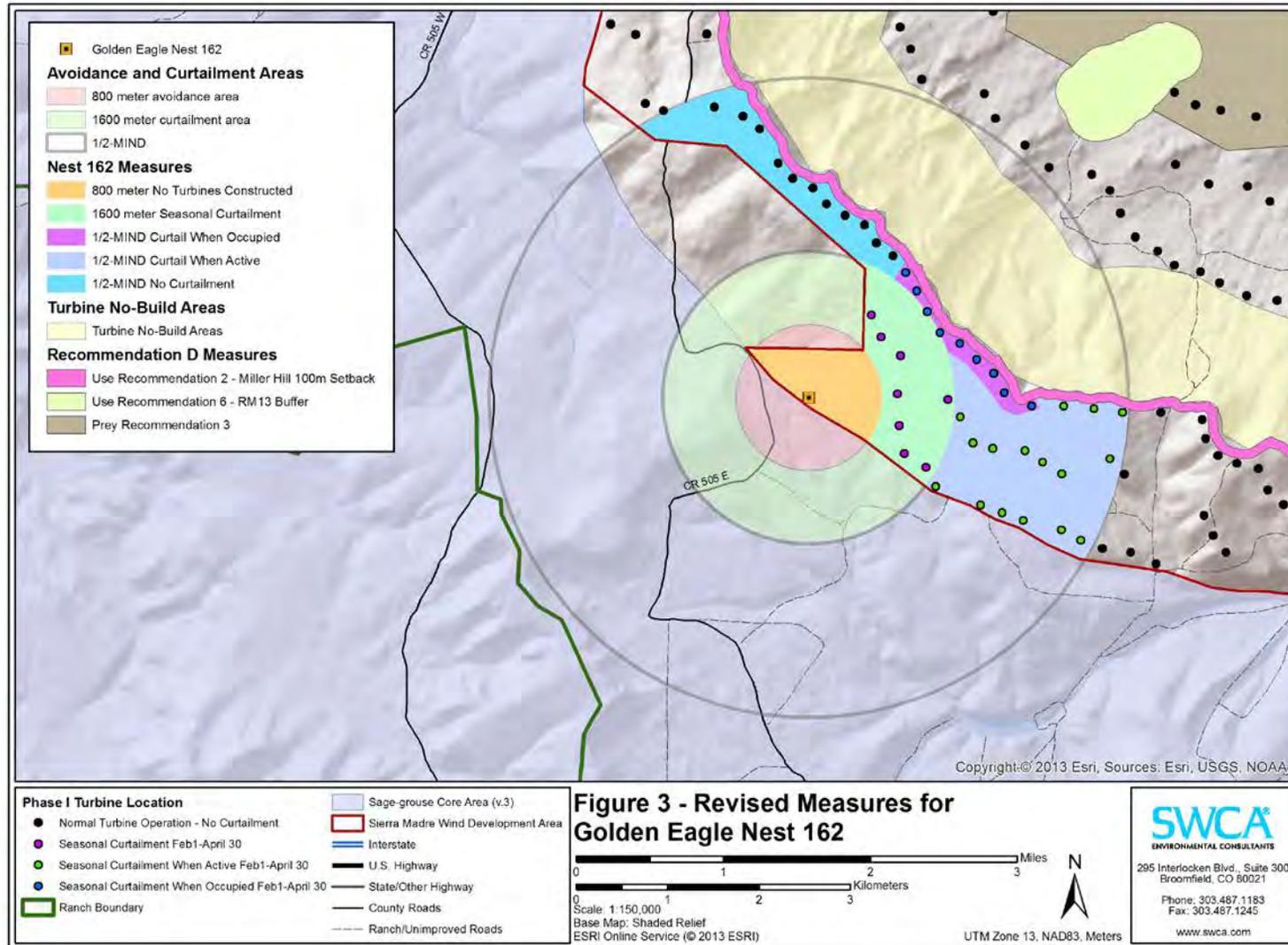
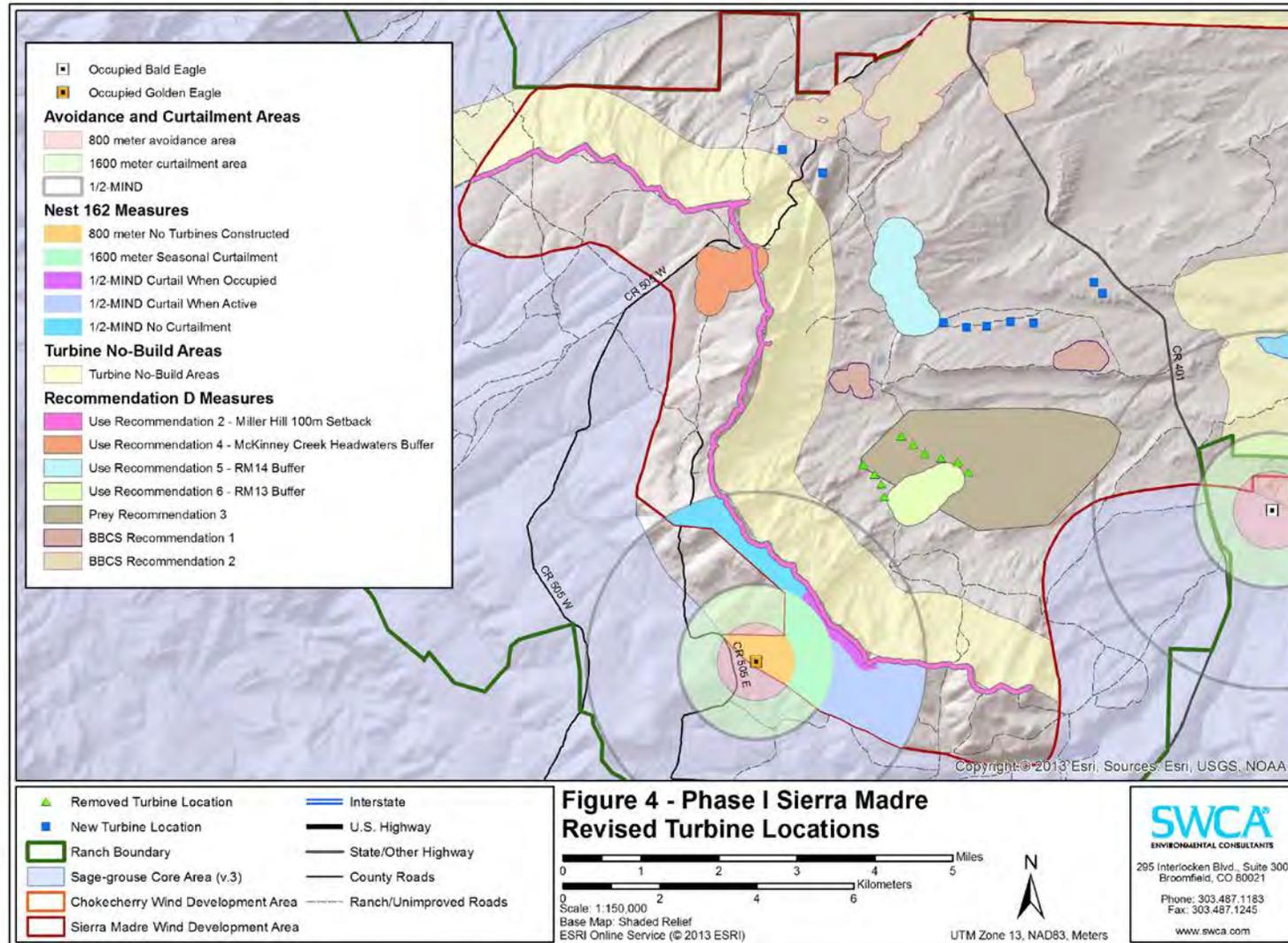
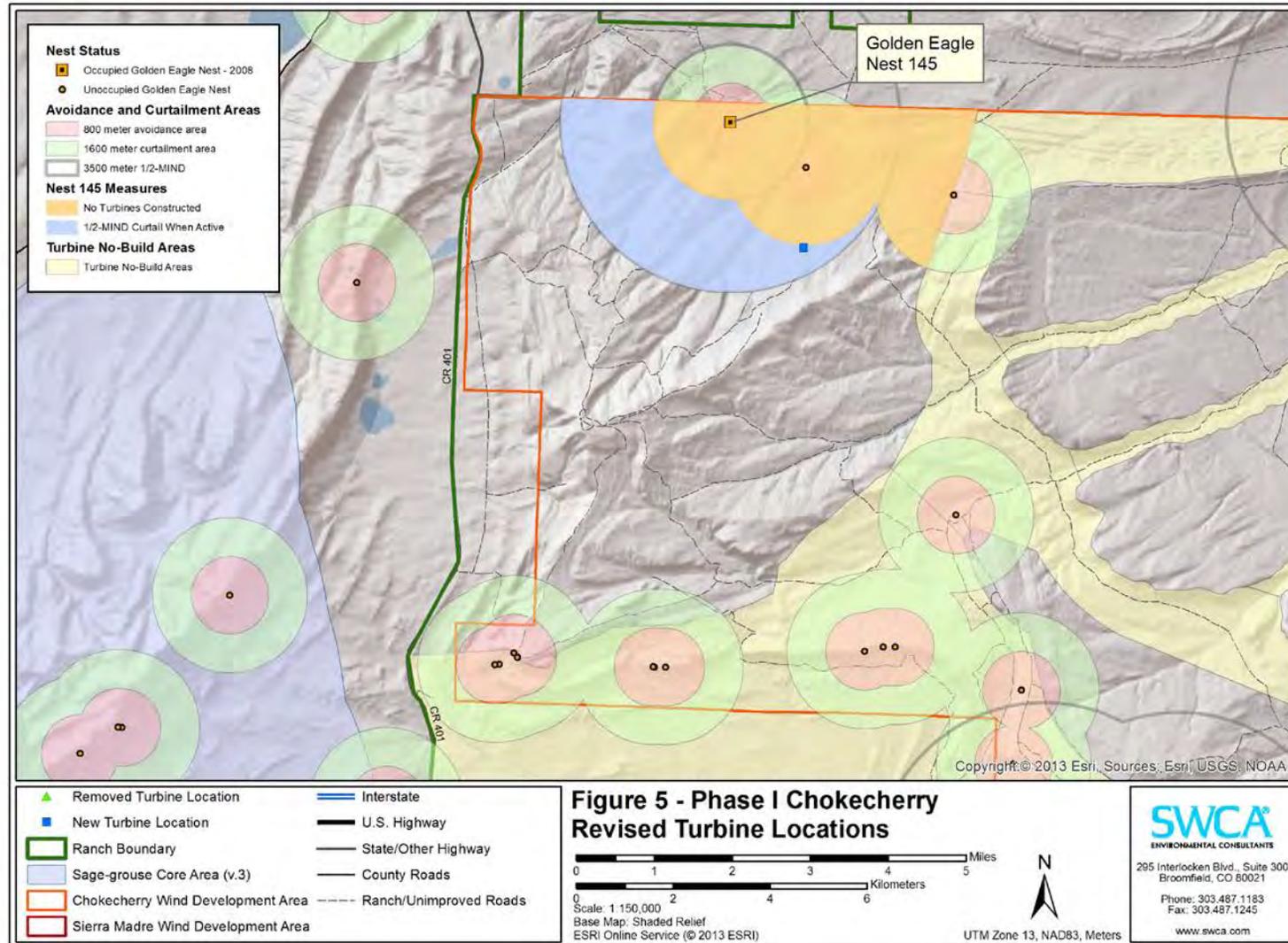


Figure 2 - Phase I Sierra Madre Turbine Layout







U.S. Fish and Wildlife Service Recommendations for Eagle Nests
Referenced in EA1 and Site-Specific Plans of Development
(SPODs 1, 2, 3, and 4) for the Chokecherry and Sierra Madre
Wind Energy Project Phase 1

U.S. Fish and Wildlife Service, Region 6, Wyoming Ecological Services Field Office
and Region 6 Migratory Bird Management Office

August 14, 2014



Recommendations for Eagle Nests Referenced in EA1 and SPODs 1, 2, 3, and 4

Quarry

Issue: The quarry is located within 540 feet of golden eagle (GOEA) nest #145 (GE20870401) that was active in 2008. Construction of the quarry is scheduled for September through October of 2014, outside of the eagle nesting season. Expected operation of the quarry during construction of the haul road and turbines and other structures is April through November.

Recommendations: We recommend PCW affirm its commitment to suspend operations at the quarry if the GOEA nest is occupied until after the young have fledged. If the nest is occupied, this means the quarry might not be usable until the young fledge, which may be in June or even July in some years, rather than starting operations in April.

Suspending operations at the quarry for two or more months could impact the construction schedule of other project features; therefore, we recommend PCW identify alternate sources of gravel and commit to using the source(s), if needed, for up to several months.

The nest is already included in annual monitoring as part of the turbine curtailment plan, but we recommend the nest also be monitored annually prior to construction and operation of the gravel pit to determine if the nest is occupied.

Haul Road

Issue: Two historical (unoccupied) GOEA nests occur within 340 feet (GE20873601) and 590 feet (GE19860702) of the haul road. The SPOD states that the location of the haul road cannot be moved due to design constraints. Construction of the haul road is expected September through November of 2014 and again from June to November in 2015, which is largely outside of the eagle nesting season. However, during turbine construction, the haul road could be in use as early as March and as late as December (SPOD 4, p. 5-2), which overlaps the eagle nesting season (generally February through July). The haul road will be decommissioned at completion of the project (p. 7-3), but use of the road (type, amount and timing) during project operations is not clearly described.

Recommendations: We recommend PCW affirm its commitment to suspend construction of the haul road near occupied nests until after the young have fledged (e.g., through July, if necessary).

We recommend the nests be monitored annually prior to operation of the haul road to determine if the nests are occupied.

Suspending use of the haul road for 2 to 5 months could substantially impact the construction schedule of the turbines. However, we recommend PCW suspend use of the haul road near any occupied eagle nest until after the young have fledged.

We recommend PCW describe plans for long-term use of the haul road after project construction (e.g., the types of vehicles, timing, and number of trips per day/week) as well as options for using other roads until surveys can determine nests are unoccupied or until young in occupied nests fledge.

If there are no alternatives and use of the haul road is necessary from February through April, then we recommend additional discussions about whether applying for a permit for disturbance take would be appropriate.

The haul road and quarry road will be designed to allow for two-way travel at 40 miles per hour. At this speed, vehicles may run over small mammals and hit large mammals, creating road-kill that may attract eagles and other birds; therefore, we recommend PCW develop a protocol to promptly remove road-kill from these roads.

North Platte River Water Facility

Issue: One bald eagle nest (HL20851101) is within 530 feet of the facility. Construction will occur June through August 2015 and will include a pump. Most activity (e.g., truck loading) will occur at the Smith Draw Water Station, many miles away, but periodic maintenance at the pump will be required.

Recommendations: If the bald eagle nest is occupied, we recommend PCW delay construction until after young have fledged.

We recommend PCW provide more details about the timing and level of activity at the facility during routine operations (maintenance) and whether there are visual barriers between the facility and the nest. Also, describe steps and measures anticipated if pump and facilities are damaged by high flows, and whether these actions can be delayed until young fledge.

We recommend PCW determine ambient noise and noise level of the pump and whether any minimization measures (e.g., sound barrier) are needed to reduce noise levels at the nest.

Transmission Pad

Issue: SPOD4 (Phase 1 Turbines) identifies one GOEA nest (GE20873601) within 475 feet of a transmission pad. This GOEA nest is the same as the one within 340 feet of the haul road.

Recommendations: The term “transmission pad” is only used in the table, but it might be the same as “substation pad” used elsewhere. We recommend PCW provide a description of a transmission pad and whether it is the foundation for an electrical substation and overhead lines.

It is difficult to provide recommendations without understanding what a transmission pad is. However, depending on the level of human activity at the pad after construction, we generally recommend avoiding disturbance within 0.5 mile from an eagle nest, though the distance could be reduced if there are visual barriers and/or human activity is of low intensity.

We recommend construction occur during the non-nesting season unless monitoring is able to determine the nest is unoccupied for that nesting season.

See recommendation under Haul Road for disturbance take.

Evaluate Additional Nests

The SPODs evaluated nests within 825 feet of infrastructure (1,200 for FEHA). However, we recommend PCW conduct an evaluation of all eagle nests within 0.5 mile (2,640 feet) of the haul road, quarry, water facilities, and all other structures and access points (roads, buildings, pads, transmission lines, etc.) regardless of land ownership. We recommend evaluating the total distance (horizontal and vertical), type and intensity and duration of disturbance, and whether there are physical barriers between the disturbance and the nest.

In general, we recommend avoid disturbance within 0.5 mile of eagle nests unless topographic features or other factors allow this distance to be reduced. If PCW cannot accommodate the 0.5-mile buffers, then we need additional discussion about disturbance and whether or not applying for an eagle take permit to cover disturbance take of eagles might be appropriate.

http://www.fws.gov/wyominges/Pages/Species/Species_SpeciesConcern/Raptors.html

Recommendation for EA1

We recommend EA1 include more information about timing of construction and operations and PCW's commitment to suspend activities if nests are occupied. These topics are discussed in the various SPODs, but it would be useful to incorporate this information in EA1 to demonstrate how disturbance to eagles is avoided and minimized. In addition, EA1 could benefit from a discussion about "disturbance" of eagle nests in the environmental consequences section.

From: [Jon Kehmeier](#)
To: [Kelly Cummins](#)
Subject: FW: CCSM Update and Next Steps
Date: Friday, October 10, 2014 4:15:49 PM
Attachments: [image001.jpg](#)
[2012-08-31 PCW Resp to T Abbott e-mail.pdf](#)

From: Garry Miller [mailto:Garry.Miller@tac-denver.com]
Sent: Friday, August 31, 2012 3:28 PM
To: Tyler_Abbott@fws.gov
Cc: Brian_A_Millsap@fws.gov; Casey_Stemler@fws.gov; Dave_E_Carlson@fws.gov; Emily_Bjerre@fws.gov; Kevin_Kritz@fws.gov; Mark_Sattelberg@fws.gov; Michael_Thabault@fws.gov; Nathan_Darnall@fws.gov; Pam_Repp@fws.gov; Patricia_Sweanor@fws.gov; Tim_Modde@fws.gov; Jon Kehmeier; Murdock, Pamela M; mvalle@blm.gov; David_Cottingham@fws.gov; Frankie_Green@fws.gov; noreen_walsh@fws.gov; Millspaugh, Joshua J.; Clint King; Roxane Perruso
Subject: RE: CCSM Update and Next Steps

Tyler,

Thank you for the below update concerning tasks the Service is working on for the Chokecherry and Sierra Madre Wind Energy Project. Please see attached letter updating you on PCW's activities. If you have any questions, please let me know.

Garry

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Vice President, Land and Environmental Affairs
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From: Tyler_Abbott@fws.gov [mailto:Tyler_Abbott@fws.gov]
Sent: Wednesday, August 29, 2012 11:21 AM
To: Garry Miller
Cc: Brian_A_Millsap@fws.gov; Casey_Stemler@fws.gov; Dave_E_Carlson@fws.gov; Emily_Bjerre@fws.gov; Kevin_Kritz@fws.gov; Mark_Sattelberg@fws.gov; Michael_Thabault@fws.gov; Nathan_Darnall@fws.gov; Pam_Repp@fws.gov; Patricia_Sweanor@fws.gov; Tim_Modde@fws.gov; Jon Kehmeier; Murdock, Pamela M; mvalle@blm.gov; David_Cottingham@fws.gov; Frankie_Green@fws.gov
Subject: CCSM Update and Next Steps

Garry,

There has been a lot of activity regarding product development by PCW and SWCA, and the review of those products by FWS, over the past several weeks. This message is to provide you an update on tasks FWS is currently working on for Chokecherry Sierra Madre, and to lay out what the Wyoming Field Office-- as the FWS lead for this project--sees as next steps.

First, from a process standpoint, I want to emphasize that the Wyoming Ecological Services Field Office in Cheyenne is the lead for this project. Although we are coordinating closely with the Migratory Bird Management Office at both the Regional and National level, the Wyoming Field Office is responsible for facilitating development (by PCW) of an Avian and Bat Protection Plan and Eagle Conservation Plan. Consequently, it is essential that information sharing by PCW and SWCA with FWS include myself and Nathan Darnall (as the staff lead on this project). The Wyoming Field Office appreciates the opportunities we have had over the past two years to coordinate and collaborate with PCW and SWCA on all issues pertaining to this proposed project, and we look forward to continuing to do so.

I understand from Kevin Kritz that you have been working on a number of things recently, including:

- working through the FWS eagle fatality model and generating estimates with clipped avoidance areas;
- developing survey methods to supplement previous and/or ongoing methods;
- eagle population abundance estimates;
- obtaining and/or consolidating information on prey bases.

I appreciate the amount of time and effort that PCW and SWCA has been continuing to invest in these activities that keep the process moving forward-- and we look forward to continuing to work with you on these efforts. In order for this office to continue to support you in these efforts, and to provide ongoing recommendations, ***I would urge you to please share these findings and products with us as soon as you can.***

It would be particularly helpful, for example, for us to understand the nature of the fatality model runs you have conducted, including data used, assumptions, or anything that may be different from the way Patuxent has conducted preliminary runs. The purpose of working together on fatality model runs is to explore the range of alternative models using various assumptions, data and inputs to facilitate our understanding of the full range of risks to eagles. A key point here is that ***the goal is to develop the best predictive model possible***-- the goal is not simply about finding ways to bring down the estimates of eagle fatality by adjusting model assumptions and/or inputs. Those fatality estimates may be affected by future survey data and will come down through a combination of avoidance and minimization measures implemented on the ground, which will be ***reflected in*** the final estimates provided by the model runs. Also, please keep in mind that as you are conducting model runs with clipped avoidance areas, the identification/determination of some of these areas may be premature since future finer-scaled data collection might suggest modifications.

Kevin also stated that you would like to have a meeting some time this week. While I will have Nathan send out a Doodle Poll to set up a meeting some time within the next month, I believe the best course of action to keep this project moving forward is for the FWS to complete several tasks it is currently working on prior to setting-up additional meetings. Additionally, this office sent a letter to PCW on August 10, 2012, articulating several issues of concern and recommendations regarding development and implementation of avoidance and minimization measures in the ABPP and ECP. This letter was issued at the request of PCW as an outcome of our meeting on July 24, 2012. This office remains concerned that-- as of yet-- these issues and recommendations have not been addressed.

FWS is currently working on the following tasks for CCSM:

- (1) Reviewing the ECP dated August 14, 2012;
- (2) Responding to a FOIA request on CCSM from American Bird Conservancy;
- (3) Developing survey recommendations/guidelines to be implemented by SWCA as soon as possible;
- (4) Completing the Biological Opinion in accordance with Section 7 of the ESA;
- (5) Working with Patuxent staff to continue preliminary fatality model runs;
- (6) Review any additional products developed by SWCA including items listed above or anything else sent for review.

As I stated above, the Wyoming Field Office looks forward to continued cooperation and collaboration with PCW and SWCA on all issues pertaining to the proposed Chokecherry Sierra Madre project. Please feel free to call me with any questions,

Thank you, Tyler

Tyler Abbott
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VIA EMAIL: Tyler_Abbott@fws.gov

August 31, 2011

Tyler Abbott, Deputy Field Supervisor
U. S. Fish and Wildlife Service
Ecological Services Wyoming Field Office
5353 Yellowstone Road, Suite 308A
Cheyenne, Wyoming 82009

Re: Chokecherry and Sierra Madre Wind Energy Project

Dear Tyler:

Thank you for your e-mail of August 29, 2012. I appreciate the update concerning the U. S. Fish and Wildlife Service's (Service) activities in relation to the Chokecherry and Sierra Madre Wind Energy Project (Project). This letter is an update on matters currently being addressed by Power Company of Wyoming LLC (PCW).

First, in regard to the communication protocol, at the end of the meeting at Region 6 on July 13, 2012, Deputy Regional Director Noreen Walsh directed that: (1) the Wyoming Ecological Services Field Office in Cheyenne is the overall lead for reviewing matters related to the Project, especially the Bird and Bat Conservation Strategy and the Eagle Conservation Plan (ECP); and (2) that Kevin Kritz of the Regional Office would be the lead and coordinate discussions related to the Service's model, and that I should communicate with him regarding modeling. I called Kevin on August 21 to inquire as to the status of the model assumptions which the Service was to provide PCW (they have since been received) and to update him on PCW's activities related to the model. I submitted the ECP to you for review on August 14, 2012 and am willing to meet with you or have a conference call with you at any time to discuss the ECP and the significant commitments it contains as well as the redesign of the Project based on PCW's eagle data.

The Service and PCW share the same goal – to develop the best predictive model possible. Towards this end PCW retained the services of Dr. Joshua Millspaugh, a leading expert in the application of statistical techniques and tools to address conservation issues. As I shared with Kevin, Dr. Millspaugh has identified several unreasonable assumptions within the Service's model in light of site-specific information that have been collected for the Project. Three areas of concern which Dr. Millspaugh is examining in depth are the Service's assumptions that (1) there is an infinite population of eagles in the Project area, (2) turbines operate during all daylight hours, all year long, and (3) the hazard area is a cylinder with infinite height around the wind turbine and the eagle is at risk anywhere within the cylinder (i.e., the model does not consider that when eagle flight height is above or below the turbine rotor swept zone, eagles are



not at risk of collision). Dr. Millspaugh is considering scientifically supportable modifications (which are both biologically justifiable and mathematically rigorous) to the Service's model to address these short-comings. When he completes his work, I will share with you his expert report(s).

Another area which Dr. Millspaugh, working in concert with SWCA, is examining is the effect PCW's Project redesign has on predicted eagle fatalities. As you know, the Service's model run included the high eagle-use areas where PCW has agreed to no turbine development. Dr. Millspaugh has rerun the model, clipping out areas of no turbine development but otherwise using all of the Service's assumptions, to arrive at a revised fatality prediction. He is presently finishing up his expert report. The report will be provided to you as soon as it becomes available.

As previously stated, the goal is to develop the best predictive model possible, one that is based on realistic, scientifically supportable data and methods; this is critical if the Service is going to rely on the model to make decisions regarding the Project. If the result of using realistic, scientifically supportable data and methods is that the fatality estimates are lower, then the Service should consider this data, not arbitrarily rely upon its initial modeling for the Project. The Service's eagle guidance directs project developers to estimate eagle fatalities prior to implementing avoidance and minimization measures and advanced conservation practices (ACPs). At this stage, PCW is still working on a realistic fatality estimate from which ACPs may be applied. As you and I have discussed, and Dr. Millspaugh will opine, the Service's estimate of 63 or fewer eagles at the 80% quantile is an extreme case and does not accurately reflect Project risk. I understood from the telephone conference calls with Emily Bjerre, Mark Otto and Brian Millsap that they were open to discussing the model and making adjustments where necessary and appropriate to arrive at a more realistic predictive fatality estimate – an estimate based on science and appropriate to PCW's site-specific conditions.

I also understood that the model is dynamic and will be adjusted in the future as additional survey data becomes available and risks to eagles from wind development are better understood. In fact, I encourage the Service to make this a "living" statistical model that is periodically updated and peer reviewed by the scientific community – both inside and outside of the Service. PCW's efforts are compliant with the Service's eagle guidance which instructs project developers to redesign their wind project such that risk to eagles might be minimized to the maximum degree achievable. PCW fully intends to incorporate future survey data, when available, into the eagle model and update the risk assessment. As detailed in the ECP, this will be done during the site-specific permitting process.

PCW and the Service discussed at the meeting on July 24, 2012, and again during subsequent conference calls, that the Service would provide PCW guidance on implementing new survey protocols prior to August 15, the beginning of the fall migration period. The Service's August 10, 2012 letter also stated that specific recommendations for data collection needs and design would be provided in the near future. The new protocols are necessary as the existing protocols, which the Service instructed PCW to implement, are based upon long-watch 4,000-meter raptor counts and use of avian radar. These surveys were designed to identify high eagle-use areas.



While being beneficial for identifying the high-use areas, informing PCW's redesign of the Project, and the development of PCW's avoidance measures that are identified in the ECP, following this protocol has resulted in an upward bias of eagle-use that has resulted in unrealistically high estimates of fatality.

Rather than waiting for additional recommendations from the Service, I asked Jon Kehmeier and Clint King of SWCA, in consultation with Dr. Millspaugh, to devise new protocols in order to insure timely implementation. Jon, Clint and Dr. Millspaugh considered the Service's model inputs and assumptions and the draft eagle guidance, including the recently available technical appendices, and devised survey protocols more appropriate to the Service's model. They also considered observational dependencies, which the Service's model fails to take into account. The new protocols are based upon a simple random sampling (SRS) design modified to provide spatial balance and to account for logistics. As you know, the Service's model assumes a completely random distribution of eagle minutes throughout the site and is spatially blind, therefore the modified SRS design is a much more appropriate and representative sampling protocol than that previously recommended by the Service and implemented by PCW. I remain concerned based upon the August 10th letter that the Service is focused on continuing surveys of high eagle-use areas. Surveying only areas of expected high eagle-use results in an upward bias in the recording of eagle minute data, a bias which the Service's model is not equipped to handle. I believe that the survey methods employed to date have adequately identified the high eagle-use areas and future surveys should focus on gathering representative data across the Project site, which is in line with assumptions of the fatality model.

SWCA has formalized the protocols (making some adjustments based upon the first two week's field experience) and these will be submitted to the Service directly.

Another item PCW is working on for the Service is the prey-base report. I have asked SWCA to take a broader view than originally anticipated resulting in additional time required preparing the report. I anticipate sending you the report next week.

A response to the Service's August 10th letter is also in preparation. I prioritized finishing the eagle model analysis, survey protocols, and prey-base report first, so the response to the August 10th letter will follow the completion of these items. However, I think that many of the issues raised in the letter have either been addressed through the ECP, or will be addressed in the model comments, prey-base report, and new survey protocols.

One last issue I wish to address in this letter, there has been intense focus over the past several weeks on the absolute value of the number of predicted eagle fatalities for the Project. While the absolute number of individual eagles potentially impacted by the Project is important, the Service must also consider the broader view of the environmental benefits to be realized through development of the Project as well as placing the Project in proper perspective with other wind projects the Service is supporting. At 3,000 megawatts (MW) and 1,000 turbines, the Chokecherry and Sierra Madre Wind Energy Project will be the largest wind project in the world. The Project will reduce CO₂ emissions by 7 to 11 million tons per year – enough to offset the emissions of between 950 and 1,400 MW of baseload coal electricity generation. The

Tyler Abbott
August 31, 2012
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Service has recognized climate change as the greatest threat to all wildlife. Therefore, the Service should also recognize the substantial environmental benefits, particularly benefits to wildlife, to be gained by development of the Project. If these benefits could be included in the Service's model for the Project, I suspect that the model would demonstrate a net gain in eagle population within the western United States.

The scale of the Project in relation to other wind projects must also be considered. For instance, the Service is considering issuing an eagle take permit for the West Butte Wind Project in Oregon – a proposed 104 MW project. I understand that the Service is about to approve a permit for take of three eagles over a five year period based upon its evaluation that this de minimis level of take complies with its eagle permit regulations. Dividing three eagles by 104 MW results in a take of 0.0288 eagles/MW/5 years. Scaling to 3,000 MW results in 86.54 eagles over a five year period, equivalent to 17.31 eagles per year. Applying the same standard to the Chokecherry and Sierra Madre Wind Energy Project as to the West Butte Wind Project, the Service should find that take levels of 86 eagles over a five year period (approximately 17 per year) is de minimis and the Project may proceed without delay. Furthermore, this is consistent with the Service's eagle guidance which identifies a 1% take within the local area population as a relatively benign harvest rate. As detailed in PCW's ECP, 1% take within the local area population is equal to 27 eagles per year, or 135 eagles over a five year period.

Finally, as summer comes to an end I want to again invite you and your staff to visit the site before it gets weathered out. I do not believe that either you or Nathan have ever visited the property and Trish was only able to spend a few hours with the BLM's biologist earlier this year driving the public roads (I ran into her and Heath that day and the weather was terrible). I would be pleased to have Jon or Clint accompany you, Nathan and Trish on a tour of the Project to discuss their observations of eagle use across the site. You could also examine the radar as an on-site visit is the most practical way to understand its benefits and limitations. Former Service-employee Travis Sanderson spent quite a bit of time participating with SWCA's crews in radar validation surveys and raptor counts, and I think he found it very helpful in understanding and evaluating eagle-use throughout the Project site.

I share your excitement on continuing to work together and collaborate on the Chokecherry and Sierra Madre Wind Energy Project so that development of this world class. Project proceeds with minimal impact on eagles as well as all other environmental resources while meeting the nation's need for clean, renewable energy.

Sincerely,

/s/ Garry L. Miller

Garry L. Miller
Vice President, Land and Environmental Affairs

From: [Jon Kehmeier](#)
To: [Kelly Cummins](#)
Subject: FW: Chokecherry & Sierra Madre Wind Energy Project - ECP Supplement
Date: Friday, October 10, 2014 4:15:55 PM
Attachments: [ECP Supp - 9 26 2012 final.pdf](#)
[2012-09-26 PCW Submittal ECP Supplement.pdf](#)

From: Garry Miller [mailto:Garry.Miller@tac-denver.com]
Sent: Wednesday, September 26, 2012 12:55 PM
To: Tyler_Abbott@fws.gov
Cc: Brian_A_Millsap@fws.gov; Casey_Stemler@fws.gov; Dave_E_Carlson@fws.gov;
Emily_Bjerre@fws.gov; Kevin_Kritz@fws.gov; Mark_Sattelberg@fws.gov; Michael_Thabault@fws.gov;
Nathan_Darnall@fws.gov; Pam_Repp@fws.gov; Patricia_Sweanor@fws.gov; Tim_Modde@fws.gov; Jon
Kehmeier; Murdock, Pamela M; mvalle@blm.gov; David_Cottingham@fws.gov; Frankie_Green@fws.gov;
noreen_walsh@fws.gov; Millspaugh, Joshua J.; Clint King; Roxane Perruso
Subject: Chokecherry & Sierra Madre Wind Energy Project - ECP Supplement

Dear Tyler:

Attached is a Supplement to Eagle Conservation Plan Addressing Estimated Eagle Fatalities for the Chokecherry and Sierra Madre Wind Energy Project. The Supplement describes the process utilized to analyze data and estimate eagle fatalities based upon PCW's re-designed project and the company's commitment not to place turbines in designated turbine no-build areas as set forth in the Eagle Conservation Plan submitted to the Service on August 14, 2012 and the attached ECP Supplement. The Supplement also incorporates the September 7, 2012 and September 12, 2012 expert reports of Dr. Joshua J. Millspaugh, which have been previously provided to the Service.

If you should have any questions, please let me know. Thank you.

Garry

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