UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

January 28, 2010

Mr. Barry Young
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109-7799

Subject: **Section 7 Endangered Species Act Consultation for the Proposed Russell City Energy Center - Hayward, California**

Dear Mr. Young:

I am writing to notify the Bay Area Air Quality Management District ("District") that the United States Environmental Protection Agency ("EPA") has fulfilled its obligations under the Endangered Species Act ("ESA") for the Russell City Energy Center ("RCEC") PSD permit proposed by the District. Enclosed is a letter from the Fish and Wildlife Service ("Service") dated January 25, 2010 which concludes that the proposed RCEC is not likely to adversely affect federally-listed or proposed species or their critical habitats that are under the administration of the Service. As EPA has met its ESA obligations with respect to the permitting action that authorizes construction of the RCEC, the District may issue a final PSD permit to the Calpine Corporation in accordance with the PSD Delegation Agreement between EPA and the District.

We appreciate your patience during the time that EPA was addressing ESA issues. If you have any questions, please contact Shaheerah Kelly of my staff at (415) 947-4156.

Sincerely,

for Gerardo C. Rios
Chief, Permits Office
Air Division

Enclosures

cc: Weyman Lee, Bay Area Air Quality Management District (via e-mail w/ enclosures)
Barbara McBride, Calpine Corporation (via e-mail w/ enclosures)

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

In Reply Refer To:
81420-2009-I-0755

JAN 25 2010

Mr. Gerardo C. Rios
Chief, Region 9 Air Permits Office
Attn: Anita Lee
U.S. Environmental Protection Agency
75 Hawthorne Street (AIR-3)
San Francisco, California 94105

Subject: Endangered Species Informal Consultation on the Proposed Russell City Energy Center Project by Calpine/GE Capital; City of Hayward, Alameda County, California

Dear Mr. Rios:

This is in response to the U.S. Environmental Protection Agency's (EPA) March 2, 2009, electronic mail message concerning informal consultation related to your review of the Bay Area Air Quality Management District's Prevention of Significant Deterioration permit for the proposed Russell City Energy Center (proposed action) by Calpine/GE Capital (project proponent) in the City of Hayward in Alameda County, California. The U.S. Fish and Wildlife Service (Service) received your electronic mail message on March 2, 2009. This response is in accordance with the requirements of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

The EPA initially requested informal consultation concerning the proposed action on June 11, 2007. After review of the material provided by the EPA concerning the proposed action, the Service responded to the EPA's request in an electronic mail message on July 31, 2007. At that time, the Service concurred with the EPA's determination that the proposed action was not likely to adversely affect any federally listed species under the administration of the Service. Subsequent to that determination, the EPA decided to prepare additional information, especially concerning nitrogen emissions that would be generated by the proposed action. On March 2, 2009, the Service received the EPA's additional information with a request to review the information. The Service has reviewed this and other additional information provided by the EPA and project proponent to determine if the Service's original determination that the proposed action is not likely to adversely affect federally listed species is still valid.

determination that the proposed action is not likely to adversely affect federally listed species is still valid.

At issue are the potential adverse effects of the proposed action to the endangered California clapper rail (*Rallus longirostris obsoletus*), salt marsh harvest mouse (*Reithrodontomys raviventrts*), California least tern (*Sternula antillarum browni*), and Presidio clarkia (*Clarkia franciscana*); the threatened Pacific Coast Population of the western snowy plover (*Charadrius alexandrinus nivosus*) and its proposed critical habitat, California red-legged frog (*Rana aurora draytonii*) and its designated and revised proposed critical habitat, Central California Distinct Population Segment of the California tiger salamander (*Ambystoma californiense*) (California tiger salamander) and its designated critical habitat, and Alameda whipsnake (*Masticophis lateralis euryxanthus*) and its designated critical habitat; and any other federally listed or proposed species under the administration of the Service.

The Service has reviewed the following information: (1) *Application for Certification for the Russell Energy Center, Hayward, California* (volumes I and II) prepared by Calpine/Bechtel Joint Development and dated May 2001; (2) *Final Staff Assessment, Russell City Energy Center Project, Application for Certification (01-AFC-7), Hayward, California* prepared by the staff of the California Energy Commission and dated June 2002; (3) *Staff Assessment – Part 1 and Part 2, Russell City Energy Center, Amendment No. 1 (01-AFC-7C), Alameda County* prepared by the California Energy Commission and dated June 2007; (4) *Final Commission Report, Russell City Energy Center, Amendment No. 1 (01-AFC-7C), Alameda County* prepared by the California Energy Commission and dated October 2007; (5) *Russell City Energy Center, Hayward, California (01-AFC-7), Amendment No. 1* prepared by Russell City Energy Company, LLC, and CH2M Hill and dated November 2006; (6) *Russell City Energy Center (01-AFC-7C) Petition for Amendment No. 2* submitted by Russell City Energy Company, LLC, and CH2M Hill and dated November 2009; (7) *Technical Memorandum: Biological Site Assessment for Russell City Energy Center Amendment No. 2 – Addition of Construction Laydown/Parking Areas* prepared by CH2M Hill and dated December 10, 2009; and (8) miscellaneous correspondence and electronic mail concerning the proposed action between representatives of the Service, EPA, and project proponent; and (9) other relevant published and unpublished studies, and communications on the distribution and abundance of federally listed species under the administration of the Service.

The purpose of the proposed action is to construct a 600-megawatt natural gas fired power plant facility and associated infrastructure along the east side of San Francisco Bay in Hayward, California. The 18.8-acre site proposed for construction of the power plant facility is currently developed and occupied by a metal fabricating business, a lumber and equipment storage yard, automobile salvage facilities, and pallet storage facilities. A natural gas line extension would be constructed along Depot Road from the proposed plant site eastward to an existing gas line near the Union Pacific Railroad line. A tie-in electric transmission line would be developed from the proposed plant site to the Eastshore Substation, mostly along an existing Pacific Gas & Electric transmission line alignment. A water pipeline and sanitary sewer line would be constructed

north of the proposed plant site. Five construction staging or laydown areas are proposed adjacent to or in the vicinity of the proposed plant site.

No habitat for any federally listed species under the administration of the Service occurs on the proposed power plant facility site, six construction staging areas, or the other areas identified above. Tidal marsh habitat for California clapper rails and/or salt marsh harvest mice is present northwest, west, and south of the proposed plant site, with the nearest habitat being approximately 1,300 feet to the south. Since 2005, California least terns have been successfully breeding and nesting on an "island" within an open water area approximately 3,400 feet southwest of the proposed plant site. Western snowy plovers also have been observed nesting at this location during the past two years and other suitable habitat for this species occurs west of the plant site along with open water foraging and resting/roosting habitat for California brown pelicans. Habitat, including critical habitat, for California tiger salamanders, California red-legged frogs, and/or Alameda whipsnakes occurs east and northeast of the proposed plant site. Critical habitat designated for the California tiger salamander (Central Valley Unit #18) is approximately 18-19 miles northeast of the proposed plant site, while critical habitat proposed for the California red-legged frog (Alameda Unit #1B) and designated for the Alameda whipsnake (Unit #3) are both at least five miles from the proposed plant site. The Presidio clarkia occurs in habitat located about 11 miles north-northwest of the proposed plant site in the Redwood Regional Park.

The Service has specifically reviewed information related to nitrogen emissions, nighttime lighting, wastewater discharge, and noise levels (both from construction and operations) at the proposed power plant facility. In particular, the Service has reviewed and evaluated data and information on anticipated nitrogen emissions from the proposed power plant facility (See enclosure.). As part of the proposed action, a variety of general and site-specific conservation measures would be implemented by the project proponent to avoid any potential adverse effects to federally listed species. These conservation measures are identified and fully discussed in the environmental documents for the proposed action identified above and other information provided to the Service. These conservation measures include, but are not limited to, the preparation of a construction noise abatement plan and a facility operations lighting plan, which would be provided to the Service for review and approval prior to being implemented. The proposed plant also would include a Zero Liquid Discharge facility which would substantially limit wastewater discharges from the power plant facility.

Based on our review of the information provided by the EPA and project proponent, we have determined that the proposed action is not likely to adversely affect any federally listed or proposed species and their critical habitat under the administration of the Service. We have determined that any potential effects to federally listed species are likely to be discountable or insignificant based on the design and location of the proposed action; the lack of habitat for any listed species on the power plant facility site and associated project areas; the low probability that any habitat, including critical habitat, for any of these species would be measurably affected

off-site; and/or the successful implementation of conservation measures being proposed as part of the proposed action.

Therefore, we have determined that the proposed action is not likely to adversely affect any federally listed or proposed species or their critical habitats that are under the administration of the Service. Unless new information reveals effects of the proposed action that may affect listed or proposed species in a manner or to an extent not considered, or a new species or critical habitat is designated or proposed that may be affected by the proposed action, no further action pursuant to the Endangered Species Act of 1973, as amended, is necessary.

If you have any questions or concerns regarding our response, please contact Jim Browning (james_browning@fws.gov) or Ryan Olah (ryan_olah@fws.gov) at (916) 414-6625, or Thomas Maurer (thomas_maurer@fws.gov) concerning nitrogen emissions and deposition at (916) 414-6600.

Sincerely,

for Cay C. Goude
Assistant Field Supervisor

Enclosure

Technical Assessment:
Listed Species and Nitrogen Deposition from the
Russell City Energy Center

January 11, 2010

Thomas C. Maurer
Chief, Investigations and Prevention Branch
Sacramento Fish and Wildlife Office
U.S. Fish and Wildlife Service
2800 Cottage Way, Room W-2605
Sacramento, California 95825
(916) 414-6594
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thomas_maurer@fws.gov

I reviewed the environmental documents, historic bay area nitrogen oxides (NO_X) data, and recent nitrogen deposition model runs for the subject power plant that were provided to me. Of primary use were the CH2MHILL Technical Memorandum dated February 24, 2009 and its attachment with AERMOD and CALPUFF modeling results. Below is a summary of the information and my assessment.

Historic Nitrogen Sources and Deposition in the Area

Anthropogenic sources of nitrogen in the San Francisco Bay area are primarily from fossil fuel combustion including mobile sources (motor vehicles, trains, airplanes, etc.) and non-mobile sources (power plants, refineries, incinerators, cement plants, etc.). Sources of NO_X emissions within Alameda County in 2002 (Figure 1) include: on-road vehicles, 27,807 tons; non-road equipment, 15,457 tons; fossil fuel combustion, 2,295 tons; industrial processes, 1,213 tons; residential wood combustion, 120 tons; and other sources, 77 tons (Source: USEPA emissions database at http://www.epa.gov/air/emissions/index.htm). This is an annual total of 46,969 tons (~129 tons per day). As per Amendment 2 for the permit, using best available technologies, the Russell City Energy Center is projected to emit 127 tons per year (~0.35 tons per day) or 0.27 percent of the 2002 total emissions for Alameda County. For comparison, the top ten NO_X sources in the San Francisco Bay area are shown in Table 1. One source emits over 2,000 tons per year and another three sources emit over 1,000 tons per year (Source: California Air Resources Board at http://www.arb.ca.gov/aqd/almanac/almanac09/excel/tableA_28.xls)

Nitrogen concentrations in air and estimated deposition rates to soils and surfaces have been declining throughout the San Francisco Bay area due to improvements in motor vehicle emissions and control technologies for power plants and other sources. For example, the mean San Francisco Bay area air concentration of NO_2 in 1988 was around 23 ppb (range ~16-32 ppb) and steadily declined to a mean of 12 ppb (range ~ 7-17 ppb) by 2008 (USEPA AIRS database). Average ambient air concentrations of NO_2 for Alameda County in 2008 were 14 ppb, down from a high of 25 ppb in 1988. Although current 2009 nitrogen emission rates in Alameda County are likely in the lower range, ammonia sources have been of recent concern especially from agriculture (fertilizers and livestock), power plants, and mobile (on and off road) sources (CENR 2000). Although catalytic converters on mobile sources have reduced NOx emissions,

ammonia emissions have increased for many vehicles up to 2001 model years (Durbin et al. unknown date). Also an increase in the number of vehicles and vehicle miles traveled may keep nitrogen emissions from declining as rapidly as expected.

Estimates provided by USEPA of South San Francisco Bay and the East Bay Hills nitrogen deposition rates ranged from 4 to 10.5 kg/ha/yr in the 1990s. In 2002, deposition rate estimates ranged from 6 to 10 kg/ha/yr (lower values along the shoreline and higher values along the foothills). These estimated deposition rates have large uncertainties in the 30 to 50 percent range. One would expect that deposition rates would be lower after 7 more years of declining total nitrogen emissions; however, site-specific rates may still be high especially if traffic levels increased nearby.

Impacts of Nitrogen Deposition

The most important impact of nitrogen deposition is excessive fertilization of nutrient poor soils such as the serpentine soils found in the hills east of Hayward. Plants adapted to survive in nutrient poor soils can not compete with invasive plants that take advantage of the increased nutrient load. A nitrogen deposition rate of 5 kg/ha/yr is a commonly used screening level for identifying potential impacts to nutrient poor soils and the native plant communities associated with them. Invasion of annual grasses in South San Francisco Bay area serpentine soils have been documented to be most intensified at nitrogen deposition rates of 5 to 11 kg/ha/yr. Nutrient poor soils such as sand dunes or serpentine soils may be impacted at even lower levels. Thus, nitrogen deposition rates have been at or above the levels of concern for decades throughout the San Francisco Bay area. There may be similar nitrogen enrichment concerns for tidal and seasonal marsh habitat along the Hayward shoreline.

Deposition Models Used for Russell City Energy Center

Two models, AERMOD and CALPUFF, were used to evaluate patterns of nitrogen depositional increases due to the new power plant. AERMOD and CALPUFF are the two air dispersion models EPA requires to be used for single source State Implementation Plan (SIP) revisions for existing sources and for New Source Review (NSR) and Prevention of Significant Deterioration (PSD) programs (http://www.epa.gov/scram001/dispersion_prefrec.htm). They both include wet and dry deposition and address ammonia emissions. The AERMOD model is not well suited for nitrogen deposition because it does not include chemical and phase transformation algorithms for nitrogen oxides. This was noted in the modeling report; however, it was assumed for the AERMOD model that all nitrogen emissions were instantaneously transformed to depositional nitrogen of concern which greatly increases the estimated depositional rates. Also, certain boundary conditions used in the model were conservative and led to increased estimations of depositional rates as well, with the end results being overestimations. CALPUFF on the other hand includes chemical transformation algorithms and is not limited by the boundary conditions of AERMOD. Thus CALPUFF likely represents a more realistic estimate of nitrogen deposition in the areas of concern.

Other input data and assumptions (chemical conversions, reactions, surface roughness, etc.) used for both models were also chosen to represent worse case scenarios for deposition, Thus, the results for both models are considered to be overestimations of what is likely to occur. Not surprisingly, of the two models, AERMOD produced results with the highest values (generally ten times higher than CALPUFF). For example, at the Garin/Dry Creek Regional Park

AERMOD estimated the mean annual deposition rate across the park to be 0.232 kg/ha/yr (max 0.321) while CALPUFF estimated 0.019 kg/ha/yr (max 0.024).

Model Results and Discussion

AERMOD

At the Hayward shoreline area maximum AERMOD deposition rates for "potentially occupied habitat" (identified using California Natural Diversity Database circles and polygons) of various species of concern within the area ranged from 0.12 to 0.37 kg/ha/yr. Assuming a current background deposition rate along the shoreline of 6 kg/ha/yr the AERMOD results represents an extreme worse case increase of 2 to 6 percent; however, the highest depositional areas (>0.25 kg/ha/yr) are industrial areas, auto junk yards, and upland sites that would not be considered habitat for the species of concern. Across the Hayward Regional Shoreline properties the AERMOD average deposition rate resulting from the power plant is 0.15 kg/ha/yr or an extreme worse case increase of 2.5 percent. St. Omer (1994) found that a South San Francisco Bay dyked, non-tidal salt marsh (New Chicago Marsh) and tidal salt marshes (Palo Alto Baylands) contained 100 to 244 kg/ha of available nitrogen. The average increase in depositional rate for the Hayward Regional Shoreline of 0.15 kg/ha/yr is 0.06 to 0.15 percent of the likely available nitrogen in the marshes.

For the Garin Regional Park the maximum AERMOD deposition rates for "potentially occupied habitat" of various species of concern ranged from 0.2 to 0.34 kg/ha/yr (an increase of 2 to 3.4 percent over an assumed 10 kg/ha/yr background depositional rate). Across the park, the average deposition rate is 0.23 kg/ha/yr, an average worse case increase of 2.3 percent.

At Redwood Regional Park the maximum AERMOD modeled deposition rate was 0.02 kg/ha/yr an increase of 0.2 percent.

At Chabot Regional Park the AERMOD maximum deposition rate was 0.03 kg/ha/yr for an increase of 0.3 percent).

In Santa Clara County the plant-available nitrogen in serpentine soils ranges from 6.1 to 6.6 mg/kg. If serpentine soils in the Regional Parks are similar then the AERMOD depositional rates modeled above would represent an increase of plant-available nitrogen of less than 1.4 percent (assuming 30 cm soil depth). Again, it is noted that these estimates represent the results using the extreme worse case AERMOD model with worse case model inputs and assumptions.

CALPUFF

For the Hayward shoreline area the more realistic, but also conservative, CALPUFF model estimated an average increase of nitrogen deposition of 0.003 kg/ha/yr with the maximum of 0.011 kg/ha/yr. These estimates are over 33 times lower than the AERMOD results. At a background deposition rate of 6 kg/ha/yr this represents an average increase of 0.05 percent (max 0.18 percent).

For the Garin Regional Park the average CALPUFF deposition rate for "potentially occupied habitat" of various species of concern was 0.019 kg/ha/yr with a maximum of 0.024 kg/ha/yr. At a background deposition rate of 10 kg/ha/yr this represents an average increase of 0.19 percent (0.24 percent max).

For Redwood Regional Park the CALPUFF average deposition rate was 0.006 kg/ha/yr with a maximum of 0.01 kg/ha/yr (0.06 and 0.1 percent increase respectively).

At Chabot Regional Park the CALPUFF maximum deposition rate was 0.02 kg/ha/yr an increase of 0.2 percent.

The CALPUFF model with estimates at least ten times lower than the AERMOD model results and also including conservative inputs and assumptions, is the more likely scenario for nitrogen deposition.

In Santa Clara County the plant-available nitrogen in serpentine soils ranges from 6.1 to 6.6 mg/kg. If serpentine soils in the Regional Parks are similar then the results of the more realistic and also conservative CALPUFF model would represent a worse case increase of plant-available nitrogen of less than 0.1 percent (assuming 30 cm soil depth).

Assessment

The CALPUFF results are likely the more realistic, but also conservative, nitrogen deposition estimates; therefore, I only considered the CALPUFF results in the final assessment. Certainly the new power plant will create a small incremental increase in nitrogen deposition in the area but because of the high uncertainties in background nitrogen deposition estimates (30 to 50 percent) it may be difficult to even measure the incremental increases within the areas of concern (for CALPUFF 0.05 to 0.24 percent increase). This increase appears to be insignificant and in some places of concern (Hayward shoreline), discountable.

Additional References

St. Omer, Lucy. 1994. Soil and Plant Characteristics in a Dyked and a Tidal Marsh in San Francisco Bay. American Midland Naturalist, Vol. 132, No. 1 (Jul., 1994), pp. 32-43.

CENR. 2000. Atmospheric Ammonia: Sources and Fate, A Review of Ongoing Federal Research and Future Needs Air Quality Research Subcommittee Meeting Report. Notes from the October 1999 meeting of the Committee on the Environment and Natural Resources (CENR) Air Quality Research Subcommittee, June 2000. 13 pp.

Durbin, Thomas D.,* Ryan D. Wilson, Joseph M. Norbeck, J. Wayne Miller, Tao Huai, and Sam Rhee. Unknown date. Emissions of Ammonia from Light-Duty Vehicles Bourns College of Engineering, Center for Environmental Research and Technology (CECERT), University of California, Riverside, CA 92521 USEPA cooperative agreement No. CX827692-01-0

Figure 1—Nitrogen oxides emissions in Alameda County for 2002. Source: EPA emissions database at http://www.epa.gov/air/emissions/index.htm.

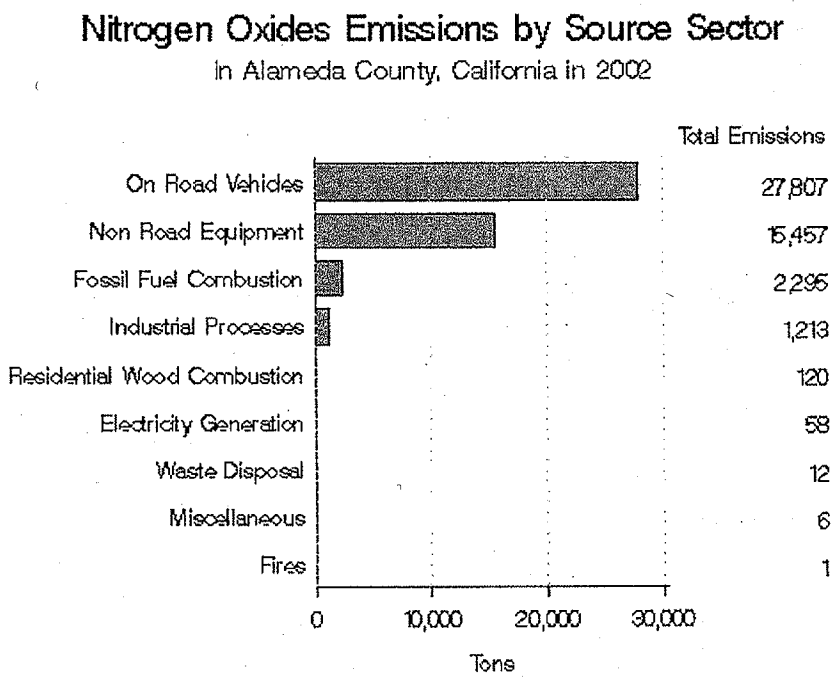

Table 1- Top ten nitrogen oxides sources in the San Francisco Bay area. Source: California Air Resources Board, 2009 Almanac at http://www.arb.ca.gov/aqd/almanac/almanac09/excel/tableA_28.xls

California Air Resources Board
2009 Almanac (web)

Appendix A San Francisco Bay Area Air Basin

Oxides of Nitrogen (NOx)

Facility Name	City	Tons per Year
Valero Refining Company - Cali	Benicia	2253
Tesoro Refining And Marketing	Martinez	1635
Hanson Permanente Cement	Cupertino	1364
Shell Martinez Refinery	Martinez	1279
Chevron Products Company	Richmond	960
ConocoPhillips Refining	Rodeo	514
ConocoPhillips - San Francisco	Rodeo	367
Owens-Brockway Glass Container	Oakland	336
PG&E Hunters Point Power	San Francisco	216
Delta Energy Center	Pittsburg	165