Russell City Energy Center Operational Noise Levels at the Hayward Shoreline Regional Park

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The Environmental Protection Agency (EPA) has requested additional information from Calpine Corporation regarding the potential effects of noise from Calpine's Russell City Energy Center (RCEC) on sensitive species that are listed under the Endangered Species Act and that may be present in units of the East Bay Regional Park District near the RCEC project site in Hayward, Alameda County, California. The EPA's inquiry is in connection with issuance of the RCEC's Prevention of Significant Deterioration (PSD) Permit by the Bay Area Air Quality Management District.

Specifically, the EPA has asked requested a noise contour map revised to expand the scope of the noise contours displayed towards the areas west of the power plant site that are near the Hayward Shoreline Regional Park (Park). Areas within the park boundary consist of native tidal saltmarsh that provide habitat for several state and federally protected species, including the salt marsh harvest mouse *(Reithrodontomys raviventris)* (federal endangered) and California clapper rail *(Rallus longirostris obsoletus)* (federal endangered, State of California threatened and fully protected). Various species of birds may also forage or nest in the park, including listed shorebirds, such as the Western snowy plover *(Charadrius alexandrinus nivosus)* (threatened), California brown pelican (*Pelecanus occidentalis californicus)* (endangered) and California least tern *(Sternula antillarum (=Sterna, =albifrons) browni)* (endangered). Betweeen RCEC and the Park lie the City of Hayward Water Pollution Control Facility's former settling ponds and sludge drying yards.

The potential impacts that might occur as a result of increased ambient noise to the salt marsh harvest mouse and California clapper rail include that these species could be more subject to predation because it might become more difficult for them to hear predators approaching. In addition, nesting birds might be disturbed by high levels of noise, which could interfere with breeding success.

These issues were considered and addressed during the California Energy Commission's (Commission) licensing and amendment proceedings for the RCEC. Staff of the Commission and RCEC agreed upon appropriate noise mitigation and, as a result, the original Commission Decision concluded that noise would cause no significant adverse impacts to biological resources. The Commission's Decision required the preparation of a Noise Mitigation Plan and the use of baffles on the pile drivers during construction and reduced-noise steam-blow technology. The CEC Staff's Assessment of the license amendment to move the location of the project concluded that the new location would have "considerably less potential for impacts to biological resources" than the original location.

The amendment Decision made slight modifications to the Condition in the original Decision which requires a Noise Monitoring and Mitigation Plan ; while it still requires such a plan, it concluded that no significant impacts to biological resources would result from either construction or operational noise resulting from RCEC.

Plot 1 shows projected noise contours of operational noise from the RCEC, as modeled for the amendment proceeding using the DataKustik software package (see AFC Section 8.7 for a full description of the modeling methodology). This plot is the same plot shown in Figure 3.7-1 of the Amendment Petition, expanded to the west to show the position of the 60 dBA contour in the direction of the Hayward Shoreline. This is the level of noise that was chosen in the RCEC licensing and amendment proceedings as a protective significance level for nesting birds and the listed species.

The plot shows that the 60 dBA contour is located approximately 750 feet west of the RCEC's western boundary. The area within which operational noise from the RCEC would be equal to or louder than 60 dBA consists of the sludge drying yards and abandoned wastewater settlement ponds. The distance from the 60 dBA contour to the edge of the salt marsh is an additional 1,370 feet, for a total of 2,120 feet (0.4 mile) from the RCEC to the park.

Projected noise at this location consists of the ambient noise plus the noise that would be attributable to the RCEC when it is operating. Ambient noise was monitored at several locations for the Commission's proceedings. Within the Hayward Regional Shoreline, these included the Hayward Shoreline Interpretive Center and Cogswell Marsh footbridge. Mostly because of the proximity to State Route 92, the 24-hour average (L_{eq}) noise level at the Shoreline Interpretive Center was a relatively high 62.6 dBA (see Table 8.7-1 of the AFC). The 24-hour L_{eq} for the Cogswell Marsh footbridge was 51.8 dBA and the latter level is probably more representative of the ambient noise levels in the park.

Noise decreases from a source as the inverse square of the distance. Or, following a common rule of thumb called the "rule of six", noise decreases approximately 6 dBA for every doubling of distance from the source.[1] As stated above, noise attributable to the project is approximately 60 dBA 750 feet west of the RCEC's western boundary, so would be 54 dBA at a distance of 1500 feet and 48 dBA at 3,000 feet, and so on.

The distance from the western RCEC boundary to the Park boundary and salt marsh habitat is approximately 2,120 feet (0.4) miles. Using the inverse square formula, the amount of noise attenuation between 750 and 2,120 feet would be 9.03 dBA. Therefore, the noise attributable to the project at this distance, the edge of the salt marsh, would be approximately 51 dBA (=60 - 9 dBA).

This is very close to the average ambient noise at Cogswell Marsh of 51.8 dBA. When combining two noise sources, the maximum in additional noise would be 3 dBA, if the two sources were identical. This would result in an additive noise of about 55 dBA.[2] This is significantly below the 60 dBA threshold that was determined in the RCEC proceeding to be protective. Generally speaking, noise levels of 50 dBA are considered comparable to the

[1] The formula for calculating the amount of noise attenuation in dBA at a given distance is 20 log (d2/d1), where d1 and d2 are two distances from a noise source.

[2] More precisely, the additive noise would be 51.8 minus 2.5 dBA, or 54.3 dBA, rounded up to 55 dBA.

noise levels in the average home or office or a quiet suburb, and noise levels at 60 dBA are considered compable to conversational speech in an office or restaurant or to background music, according to Airport Noise Law.[3] These levels of noise are considered "quiet."

In conclusion, operational noise from the RCEC would not have a significant adverse effect on listed or sensitive species or nesting birds in the Hayward Shoreline Regional Park. Any potential effects of project construction would only be temporary and would be mitigated to a level below significance by the implementation of mitigation measures stipulated in the Commission's Decision document. For the foregoing reasons, noise related to RCEC is not expected to have any significant impacts on species of concern.

[3] http://airportnoiselaw.org/dblevels.html