Los Angeles Department of Water & Power

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November 4, 2014

Mr. Jonathan Bishop
Deputy Chief,
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Dear Mr. Bishop:

Subject: Submittal and Discussion Entrainment and Impingement Technologies Evaluation Reports for the Los Angeles Department of Water and Power's (LADWP) Harbor (HGS) and Haynes (HnGS)

The Statewide Once Through Cooling Policy, Section (2)(C)(4)(b) requires that existing power plants with compliance dates after December 31, 2022, "Conduct a study or studies, singularly or jointly with other facilities, to evaluate new technologies or improve existing technologies to reduce impingement and entrainment." To that end, please find enclosed copies of both reports, evaluating impingement and entrainment technologies at the LADWP's HGS and HnGS, titled: *Final Report Evaluation of Impingement and Entrainment Technologies for Harbor and Haynes Generating Stations, dated July 2014 and Evaluation of Impingement Mortality Reducing Technologies for Harbor and Haynes Generating Stations, dated July 2014,* which LADWP commissioned from the Electric Power Institute (EPRI), Tenera, and MBC.

Representatives from EPRI, MBC, Tenera, and LADWP met with you to discuss the general findings for the EPRI entrainment study and you and the State Water Resources Control Board (SWRCB) staff to discuss the general findings of the EPRI Impingement Mortality (IM) study.

Before highlighting the Studies and recapping the discussions, LADWP would like to summarize pertinent elements of the OTC Policy.

1. As noted above, Section (2)(C)(4)(b) requires that LADWP conduct a study or studies.
2. Section (2)(C)(4)(c) states: "Submit the results of the study **and a proposal to minimize entrainment and impingement** (emphasis added) to the Chief Deputy Director no later than December 31, 2015.
3. This is followed by Section (2)(C)(4)(d): "Upon approval of the proposal by the Chief Deputy Director, complete implementation of the proposal no later than December 31, 2020."
4. Section (2)(C)(3)(a): explains that owners must also comply with the "Immediate and Interim Requirements" by means of existing mitigation efforts (page 8); or (2)(C)(3)(b and e) by means of funding the California Coastal Conservancy (page 8).

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As discussed at the meetings and as will be revealed in the studies, as part of implementing any technologies in situ, the first step is to evaluate and research which technologies warrant further evaluation. The technologies researched for HGS and HnGS were intended to determine 1) which, if any, technologies could be implemented, 2) the calculated efficacy for reduction for species representing more than ninety five percent (95%) of the E and IM at both facilities, 3) the cost versus the environmental benefit, and 4) impacts to grid reliability. After reviewing the full range of new and currently available fish protection technologies, the best candidate technologies were selected for each facility and the results of a detailed evaluation of those technologies were presented at the meetings.

During the first meeting with the State Board, LADWP showed that entrainment technologies did not merit further consideration due to factors that included poor fish protection performance, technical issues associated with the facility location, permitting issues and approvals associated with installation and associated costs. For example, at HGS it was concluded that at an estimated cost of $7 million, cylindrical wedgewire screens would reduce entrainment by less than 25% and pose the risk of re-entrainment. At HnGS, installation of screens in the existing intake canal would require additional pumps to generate the sufficient current needed. This in turn would double the current entrainment rate. It was also agreed at this meeting that flow reduction was most likely the most effective entrainment reduction technology. LADWP has already reduced flow at HGS by 72%, through the elimination of five units replaced with one combined cycle unit and reduced 50% of the flow at the HnGS by replacing Units 3 and 4 with a combined cycle Unit 8 and the conversion to dry cooling and elimination of OTC at Units 5 and 6. Flow reduction through other means such as reduced cooling water pump use or variable frequency drives on pumps, is not feasible when the majority of E coincides with periods of maximum power demand, as it does in LADWP's service territory. This is because reduced flow reduces the generating units' efficiency and therefore power output. Due to the configuration of LADWP's grid and system reliability requirements (i.e., no capability to import power from outside LADWP's grid), additional flow reduction – or reduced energy output – is not possible.

With respect to IM and as discussed at the meeting last June 2014 and shown in the studies, the IM levels have dropped significantly since 2006 at both HGS and HnGS. There is the expectation of a further reduction in both impingement and entrainment at the HnGS due to the recent elimination of OTC at Units 5 and 6. As indicated in the reports, the costs of the IM technologies are wholly disproportionate to the number of fish saved. The estimated technology costs for HGS and HnGS, when amortized over a ten-year operating period is $2,000 and $12,000 per pound of fish, respectively. LADWP believes these costs pose an unreasonable burden on LADWP's ratepayers (who are already bearing the significant cost of conversion to dry cooling) for no meaningful improvement to the fishery during the interim period. In addition, for some options there are uncertainties and permitting difficulties due to the interference with ship navigation in Slip 5 for HGS and for HnGS some options would significantly impact the Long Beach Marina. LADWP is further concerned with potential grid reliability issues with placing the IM technologies in either the Slip 5 for HGS or the intake canal or Long Beach Marina for HnGS due to the lack of flow, clogging, and high marine biofouling environments.

In light of a combination of conditions that include:

- the significant flow reductions already achieved at HGS and HnGS;

- the additional scheduled flow reductions;
- the complete elimination of OTC;
- the high costs and uncertainties associated with E and IM technologies;
- the very real risk of increased I associated with some technologies;
- the very little benefit to the fishery; and
- the high risk posed to grid reliability,

it has been determined that mitigation compensation is in the best interests of all parties and the only avenue that is guaranteed to confer interim and permanent, significant benefits. Therefore LADWP's proposal for Section (2)(C)(4)(c) is that LADWP will pay $3 per million gallons to the California Coastal Conservancy as outlined in paragraphs (2)(C)(4)(e) commencing October 1, 2015 and continuing until OTC is eliminated at each unit. In addition, LADWP requests that the currently achieved flow reductions at HGS and HnGS be recognized as improvements to reduce impingement and entrainment. This combination of mitigation funding and the already completed significant flow reductions will guarantee interim and meaningful permanent environmental benefits.

LADWP looks forward to hearing from you and working with the SWRCB staff on implementing the Statewide Policy. If you have any questions or require additional information, please contact Ms. Katherine Rubin of Environmental Affairs Wastewater Quality and Compliance Group at 213-367-0436.

Sincerely,

Mark J. Sedlacek
Director, Environmental Affairs

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Enclosures
By Federal Express
c: Ms. Felicia Marcus, Chair, SWRCB
Ms. Fran Spivy-Weber, Vice-Chair, SWRCB
Ms. Tam Doduc, Board Member, SWRCB
Ms. Dorene D'Adamo, Board Member, SWRCB
Mr. Steven Moore, Board Member, SWRCB
Mr. Thomas Howard, Executive Director, SWRCB
Ms. Caren Trgovcich, Deputy Chief, SWRCB
Ms. Mariela Carpio-Obeso, SWRCB
Ms. Shuka Rasteqarpour, SWRCB
Mr. David Bailey, EPRI
Mr. Shane Beck, MBC
Mr. John Steinbeck - Tenera
Ms. Katherine Rubin, LADWP