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Sent via email to srastegarpour@waterboards.ca.gov

Ms. Shuka Rastegarpour
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P.O. Box 100
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Re: Friends of the Earth's Comments on Bechtel Power's Final Phase I SONGS Report

Dear Ms. Rastegarpour,

Friends of the Earth (FOE) appreciates the opportunity to comment on the interim technical report on alternate cooling technologies for the San Onofre Nuclear Generating Station (SONGS).[1] FOE is a U.S. Internal Revenue Code §501(c)(3) non-profit organization that has worked for over forty years to reduce economic drivers that encourage environmental degradation from nuclear energy and address the threats to human health and the environment that nuclear power poses. FOE and its affiliates have used, and continue to use, technical and policy expertise to combat irresponsible nuclear development in state, federal and international arenas. Specifically, FOE's nuclear campaign works to reduce risks for people and the environment through its efforts to close and defund existing nuclear reactors and by fighting proposals to build new reactors.

FOE generally supports the report's conclusion that only certain technologies are appropriate for further and more intensive review in Phase II. FOE emphasizes, however, that two considerations should be taken into account and incorporated into the Phase II study:

(1) Wet closed-cycle cooling systems (WCC) using fresh or reclaimed water sources are the environmentally preferred alternative; and

(2) Significant attention should be given to the full range of costs and measures

[1] Independent Third-party Interim Technical Assessment for the Alternate Cooling Technologies or Modifications to the Existing Once-Through Cooling System for San Onofre Nuclear Generating Station prepared for Southern California Edison Company (SCE) and the Nuclear Review Committee of the State Water Resources Control Board (Board) by Bechtel Power Corporation (Bechtel Report), as revised November 5, 2012.

> associated with the likely environmentally preferred alternative, as the public has an interest to know the full costs of the continuing use of nuclear generation in California.

Additionally, FOE suggests that it is time for the Board to revisit its assumptions about the "essential" need for the SONGS plant in California's generation mix. Southern California survived 2012 without SONGS, and there are more cost-effective and environmentally friendly resources than SONGS that are available to meet electrical demand in California, both now and in the future.

Wet Closed-Cycle Cooling Technology Is the Environmentally Superior Option

FOE recognizes that the consultant's task of exploring options for compliance with OTC policy is an enormous undertaking. SONGS is a large generating facility with a massive water appetite, located in the shadow of the most heavily populated and one of the most water-constrained regions in the United States. Consideration of alternatives to SONGS' existing cooling process is a high-stakes process with little margin for error in base assumptions.

FOE expects that implementation of any of the identified alternative cooling technologies will be a monumental and costly task, with potentially significant environmental effects. It is therefore reasonable for the Board to assume that the scale and extent of any of these options will trigger environmental review under the California Environmental Quality Act (CEQA).[2] Under the CEQA process, feasible alternatives will be considered, and the environmentally superior alternative will be identified. Based on the information contained in, and the conclusions of, the Bechtel report, it appears likely to FOE that the WCC option — with make-up water from fresh or reclaimed water sources — will be the environmentally preferable alternative.

The alternatives fail to address the significant environmental impacts of the existing SONGS water intake systems. For example, Bechtel asserts on behalf of SCE, that inshore fine mesh screens could significantly decrease impingement and entrapment of marine life and fish eggs. In support of this, Bechtel states:

> Enercon conducted alternative intake technologies evaluation for Indian Point 2 &3 (Enercon 2010) and concluded that use of the wedge wire screens can be effective in reducing entrainment up to 89.8 percent and impingement up to 99.9%. It also concluded that use of both 2 mm slot and 9 mm slot would achieve substantial EA1 (Equivalent Age 1) impingement and entrainment reduction. EA1 is defined as the number of age 1 fish that eggs, larvae, and juveniles lost to entrainment would have been expected to produce had they not been entrained. Due to the uncertainty with ice buildup on screen and debris clogging for narrow slot openings (2 mm slot or lower), Indian Point also intends to conduct site specific testing using two slot sizes, 2 mm slot and 9 mm slot. This approach is consistent to our recommendation to DCPP and SONGS to conduct the testing for 2

[2] Cal. Pub. Res. Code § 21000, *et seq.*.

mm slot as well as 6 mm slot opening.[3]

However, fine mesh screens impinge organisms typically entrained on coarser screens. Further, impingement can increase the mortality of marine organisms, depending on life stages of those marine animals; the decrease in entrainment mortality is offset and potentially exceeded by impingement mortality.[4]

In addition, fine mesh screens increase the likelihood of debris loading and clogging of the screens. Low intake flow velocities help to decrease loading and clogging, but the SONGS station has a high intake flow velocity – a significant drawback acknowledged in the Bechtel analysis.[5] In order to remedy this problem with the fine mesh screen proposal, the screen house would be tied into the existing intake pipes. This would allow for a bypass of the clogged screens, but defeat the marine protection purpose of these screens to begin with. Further, this technology has never been used for a nuclear facility, never been used in a large generating facility, and has never been tested in ocean waters. As such, there is no empirical data regarding the impact of tidal flows and salt water on screen clogging and the need for bypass to existing intake systems.

This alternative is environmentally preferable, because it best satisfies the Board's OTC policy.[6] Use of WCC eliminates impingement and entrainment issues, minimizes thermal pollution associated with the SONGS units, and avoids significant marine impacts associated with other alternatives.[7] Unlike dry closed-cycle options, which create substantial negative operating efficiency impacts on steam generators and require very tall cooling towers, WCC technologies minimize the loss of generator efficiency and allow significantly shorter towers. This would, in turn, minimize impacts on visibility and military training activities at Camp Pendleton.[8] This fact alone sufficient to warrant serious and comprehensive consideration of WCC during Phase II.

The Phase II Study Should Consider the Full Range of Costs Associated with WCC

The potential environmental downsides of continued operation of SONGS are profound. Accordingly, most aspects of SONGS' operation are subject to rigorous regulatory review. Compliance with OTC policy is but one of several serious regulatory hurdles currently facing

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[3] http://www.swrcb.ca.gov/water_issues/programs/ocean/cwa316/rcnfpp/docs/rcc_resp.pdf

[4] http://www.dec.ny.gov/docs/permits_ej_operations_pdf/alttechrep.pdf

[5] http://www.swrcb.ca.gov/water_issues/programs/ocean/cwa316/rcnfpp/docs/songsfm.pdf

[6] *See, e.g.,* OTC Policy Section 1.M ("To conserve the State's scarce water resources, the State Water Board encourages the use of recycled water for cooling in lieu of marine, estuarine or fresh water."); Bechtel Report at 82 ("These [non-seawater] sources are assumed to be available from water treatment facilities and, thus, impingement/entrainment associated with intake structures from oceans or other open water sources would not be present.")

[7] Bechtel Report at 98-103.

[8] *See* Bechtel Report at 14, 23-24, 63.

SONGS, making it critical that the public and other interested parties — including regulators — are aware of the true costs of continuing to operate coastal, nuclear plants in the State of California. FOE accordingly asks the Board to assure that the consultant leaves no stone unturned in determining the true costs of implementing WCC at SONGS.

Past studies regarding the adoption of WCC at SONGS reveal the magnitude of expenses — estimating initial direct capital expense of approximately $600 Million[9] — but those studies fail to include several important cost categories, such as the cost of obtaining PM-10 credits and the cost of alternate water supplies. Bechtel's Phase II study should go further than these prior efforts and should:

- identify the costs of obtaining and delivering reclaimed water, including the capital costs and regulatory-related expenses of constructing a 20 mile pipeline to deliver water from multiple sources;
- verify whether there is sufficient available capacity of reclaimed water capable of meeting SONGS' make-up water demand;
- determine the amount of capacity, if any, that cannot be met by reclaimed water sources and estimate the full capital and operating costs associated with construction and operation of an on-site desalination facility to meet that need;
- determine the price volatility and supply risks associated with long-term reliance on these water sources;
- determine the likely water quality of available sources, including dissolved solid concentrations, and estimate the PM-10 emissions that would be associated with using these make-up water sources;
- estimate the costs to obtain the necessary PM-10 emissions credits[10] to comply with San Diego APCD limits based on the projected water quality of available sources; and
- quantify the replacement or relocation costs for all facilities at the Mesa Complex that would be displaced to accommodate the land requirements for constructing and operating cooling towers.

Many of these factors also represent significant ongoing operational expenses. Phase II should therefore also consider the net present costs of the various alternatives over the life of the facility.

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[9] *See, e.g.,* "California's Coastal Power Plants: Alternative Cooling System Analysis" (Tetra Tech), at Chapter N-1 (Table N-1) (estimating initial capital costs of approximately $593 million) (2008), *available at* http://www.opc.ca.gov/2009/05/california%E2%80%99s-coastal-power-plants-alternative-cooling-system-analysis/; "Feasibility Study for Installation of Cooling Towers at San Onofre Nuclear Generating Station" (Enernoc), at 59 (estimating initial direct capital costs of approximately $615 million) (2009).

[10] Enernoc's study assumed initial overall capital costs of converting to a closed-cycle system to be approximately $3 billion, excluding the costs of PM-10 credits, which would cause the estimate to "increase significantly…." Enernoc at p. v (Executive Summary).

SONGS' Prolonged Outage Reveals that the Board's Policy Assumptions Regarding Power Reliability Need to Be Recalibrated

The experience of this past summer demonstrates that it is a myth to state that SONGS is "absolutely essential" to the provision of reliable power to California ratepayers. When the plant went down in February, doomsayers predicted blackouts in Southern California. However, the blackouts never materialized. Rather, a well-coordinated and conscientious effort on the part of the utilities, the owners of independent generation, the California Independent System Operator (CAISO) and key state officials succeeded in pulling together the resources needed to keep the lights on. These resources included significantly enhanced energy efficiency and demand response. Indeed, effective energy efficiency and demand response programs can make up much, if not all, of the perceived future shortfall from the permanent shutdown of SONGS, especially if the plant must be operated at less than full power.

This outcome was not a one-year phenomenon. The CAISO has just completed a preliminary analysis[11] showing that the electric system in Southern California can operate reliably in 2013 and beyond without SONGS. In truth, electric power systems that rely too heavily on a single large plant are putting "too many eggs in one basket." Such large, dominant plants are actually more the enemy than the friend of grid reliability. Moreover, plants like SONGS are highly inflexible in that they cannot respond quickly or easily to signals to increase or decrease their generating output. Such plants are increasingly at odds with the evolving electric power system in California, which, with its ever-increasing penetration of variable renewable resources, needs highly flexible resources more than ever.[12]

The basic question for the Board, and its policy assumptions about the need for SONGS, is one of proportion. Does it still make sense to give a policy preference to SONGS when it is clear that SONGS is not "essential"[13] to the welfare of California citizens and that SONGS is likely responsible for a disproportionate share of state-wide impingement,[14] given the scale of its operations and the operational characteristics of continuous, baseload generation? Discontinuing the use of SONGS is now on the table before several agencies with appropriate authority.

The Board should accordingly recalibrate its assumptions about the role that SONGS plays in meeting the needs for electric power reliability in Southern California to reflect this new reality. To the extent that SONGS is the largest single source in Southern California of the adverse

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[11] This analysis was presented at a public stakeholders meeting on the CAISO's 2012-2013 Transmission Planning Process on September 26, 2012. The PowerPoint presentation that includes this analysis is available at: http://www.caiso.com/Documents/Presentation_2012-2013TransmissionPlanningProcessPreliminaryStudyResults-ProposedSolutions.pdf.

[12] The need for more highly flexible resources is well recognized both by the CPUC and the California ISO, both of which entities have been sponsoring multiple stakeholder processes on the subject over the past few months.

[13] *See* OTC Policy, Section 1.G ("The intent of this Policy is to ensure that the beneficial uses of the State's coastal and estuarine waters are protected while also ensuring that the electrical power needs essential for the welfare of the citizens of the State are met.")

[14] *See* "Assessment of Once-Through Cooling System Impacts to California Coastal Fish and Fisheries" (EPRI), at 3-37 (noting that impingement at SONGS was "several orders of magnitude greater than the levels at Huntington Beach and Ormond Beach.") (2007), *available at* http://www.swrcb.ca.gov/water_issues/programs/ocean/cwa316/docs/epri_assessment_impacts.pdf .

impacts on the marine environment associated with OTC at coastal power plants, the Board should re-prioritize its focus to address the OTC impacts of SONGS ahead of the similar impacts associated with the smaller and less frequently used coastal gas-fired power plants that are also subject to the Board's authority. It is no longer necessary to make trade-offs that compromise the integrity of California's marine environment for the sake of SONGS' illusory status as an indispensible reliability resource.

FOE appreciates this opportunity to comment and encourages the Board and its consultant to identify all potential costs associated with the environmentally preferable WCC option.

Sincerely,

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