

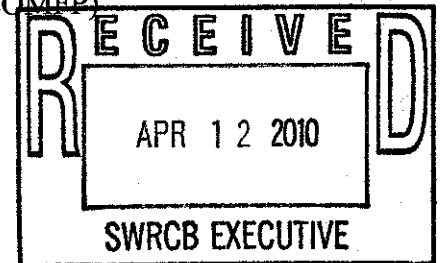
## Comment Letter on OTC Policy

Submitted to:

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SLOMFP responds to the revisions to the draft statewide policy governing use of coastal and estuarine waters for power plants utilizing once-through cooling (OTC), particularly as it relates to Diablo Canyon Nuclear Power Plant (DCNPP).

**SLOMFP finds the revisions regarding nuclear-fueled power plants to be out of compliance with the intent of the Federal Clean Water Act, Section 316(b)** which requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available (BTA) to minimize adverse environmental impacts to aquatic organisms (i.e., fish, shellfish, and other forms of aquatic life) due to (1) impingement mortality on intake screens, and (2) entrainment of eggs and larvae through cooling water systems. (<http://www.epa.gov/waterscience/316b/basic.htm>)

There is a concerted effort by state and federal agencies to implement 316(b). The California State Lands Commission adopted a resolution which includes plans to expedite the policies and to prohibit license extensions to existing plants which utilize OTC:

**RESOLVED**, by the California State Lands Commission that it urges the California Energy Commission and the State Water Resources Control Board to expeditiously develop and implement policies that eliminate the impacts of once-through cooling on the environment, from all new and existing power plants in California; and be it further

**RESOLVED**, that the Commission shall not approve new leases for power facilities, or leases for re-powering existing facilities, or extensions or amendments of existing leases for existing power facilities, whose operations include once-through cooling, unless the power plant is in full compliance, or engaged in an agency-directed process to achieve full compliance, with requirements imposed to implement both Clean Water Act Section 316(b) and California water quality law as determined by the appropriate agency, and with any additional requirements imposed by state and federal agencies for the purpose of minimizing the impacts of cooling systems on the environment... (Resolution by the California State Lands Commission Regarding Once-Through Cooling in California Power Plants, Adopted by the California State Lands Commission on April 17, 2006, at 3, [http://www.energy.ca.gov/siting/documents/2006-0413\\_SLC\\_PROPOSED\\_COOLING.PDF](http://www.energy.ca.gov/siting/documents/2006-0413_SLC_PROPOSED_COOLING.PDF))

The Clean Water Act was first promulgated in 1977 to protect our waters, and the State Water Resources Control Board (State Water Board) now conspires to further delay protective measures. The draft revisions provide innumerable loopholes for the two nuclear-fueled power plants in California to continue to degrade coastal waters indefinitely. SLOMFP objects to the rationalizations of high cost, low greenhouse gas emissions, and the need for power to justify the on-going destruction of the marine environment. The revisions defy the objective of the Clean Water Act.

**The OTC system has resulted in significant degradation to the marine environment, and the revisions to the draft OTC policy must not condone its continued use.** DCNPP utilizes an OTC water system that withdraws 2.45 billion gallons of raw seawater from the Pacific Ocean per day through shoreline intake and discharge structures. It discharges back into the ocean at a separate location and 20 degrees warmer. Intensive monitoring in the vicinity of the DCNPP over the years of operation has generated tremendous amounts of evidence that the OTC system has resulted in significant degradation to the marine environment. Pacific Gas & Electric Company (PG&E) admits in its License Renewal Application that "For all regulatory and assessment purposes, entrainment losses caused by DCNPP are considered 100 percent of all organisms withdrawn from the Pacific Ocean with the intake flow under all conditions. Annual entrainment of larval fish is estimated to range between 1.48 and 1.77 billion." (Diablo Canyon Power Plant License Renewal Application, Appendix E, Environmental Report, at 4.2-6, <http://www.nrc.gov/reactors/operating/licensing/renewal/applications/diablo-canyon/dcpp-er.pdf>)

In July of 2009, the State Water Resources Control Board confirms the fact that OTC degrades the aquatic environment.

The State's active coastal power plants that use OTC maintain the capacity to withdraw more than 16 billion gallons of cooling water per day. Over the course of a year, billions of eggs and larvae are effectively removed from coastal waters, while millions of adult fish are lost due to impingement. These OTC systems, many of which have been in operation for 30 years or more, present a considerable and chronic stressor to the State's coastal aquatic ecosystems by reducing important fisheries and contributing to the overall degradation of the State's marine and estuarine environments. (Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, State Water Resources Control Board, California Environmental Protection Agency, at 1, [http://www.swrcb.ca.gov/water\\_issues/programs/npdes/docs/cwa316/draft\\_sed.pdf](http://www.swrcb.ca.gov/water_issues/programs/npdes/docs/cwa316/draft_sed.pdf))

It additionally states:

The consensus among regulatory agencies at both the state and federal levels is that once through systems contribute to the degradation of aquatic life in their respective ecosystems. In its 2005 report, the CEC concluded once-through cooling systems were "partly responsible for ocean degradation" and contributed to declining fisheries and impaired coastal habitats through the intake of large volumes of water and the discharge of elevated-temperature wastewater. The development record for both the Phase I and Phase II rules contain numerous documented examples of significant impacts from OTC on aquatic communities, including California. (Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, State Water Resources Control Board, California Environmental Protection Agency, at 28, [http://www.swrcb.ca.gov/water\\_issues/programs/npdes/docs/cwa316/draft\\_sed.pdf](http://www.swrcb.ca.gov/water_issues/programs/npdes/docs/cwa316/draft_sed.pdf))

The report further states that:

...entrainment is still significant. Diablo Canyon entrainment impacts an average source water coastline length of 74 kilometers (46 miles) out to 3 kilometers (2 miles) offshore, an area of roughly 93 square miles, for nine taxa of rocky reef fish. These rocky reef fish included smoothhead sculpin, monkeyface prickleback, clinid kelpfishes, blackeye goby, cabezon, snubnose sculpin, painted greenling, Kelp/Gopher/Black-and-Yellow (KGB) Rockfish Complex, and blue rockfish. In that 93 square mile source water area, an average estimated proportional mortality of 10.8 percent was calculated for these rocky reef taxa. The rocky reef fish species with the largest calculated coastline impact was the smoothhead sculpin, having an estimated proportional mortality of 11.4 percent over 120 kilometers (75 miles) of coastline during a 1997-98 sampling period. (Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, State Water Resources Control Board, California Environmental Protection Agency, at 30, [http://www.swrcb.ca.gov/water\\_issues/programs/npdes/docs/cwa316/draft\\_sed.pdf](http://www.swrcb.ca.gov/water_issues/programs/npdes/docs/cwa316/draft_sed.pdf))

In its 2000 Staff Report,

[http://www.waterboards.ca.gov/centralcoast/water\\_issues/programs/diablo\\_canyon/docs/2000\\_07\\_13\\_diablo\\_staff\\_report.pdf](http://www.waterboards.ca.gov/centralcoast/water_issues/programs/diablo_canyon/docs/2000_07_13_diablo_staff_report.pdf), the CRWQCB noted that:

The most significant and consistent biological effects caused by PG&E's Diablo Canyon thermal discharge occur mainly along the intertidal and shallow subtidal marine environment. The intertidal and shallow subtidal zone in Diablo Cove is the most heavily impacted, with major reductions in important species such as habitat forming algae and intertidal fish. (at 1)

Regional Board staff contends that thermal effects exceed those anticipated by the State and Regional Board when the plant was permitted and so do not protect beneficial uses as required by the Thermal Plan. (at 1)

The entrainment study at Diablo Canyon was overseen by a technical workgroup that included independent consultants for the Regional Board (Dr. Greg Cailliet, MLML; Dr. Roger Nisbet, UCSB; Dr. Allan Stewart-Oaten, UCSB), a consultant for the League for Coastal Protection (Dr. Pete Raimondi, UCSC), and PG&E and its consultants from Tenera. The technical workgroup reviewed all aspects of the study, including sampling equipment, sampling periods, target species selection, larval identification, and analyses of the results via a process that continued for almost five years. Entrainment Studies at Diablo Canyon began in October 1996, and continued through June 1999 (about 2 ½ years of sampling in front of the intake structure). (at 2)

The results show that:

the amount of larvae lost for nearshore species is relatively high. These non-harvested near shore species have no direct dollar value in terms of commercial fisheries, but are important in an ecological sense. For several nearshore species (sculpins, kelpfish, blackeye goby, monkeyface prickleback), the amount of larvae taken by the power plant is large relative to the amount available in the source water body. (at 3)

Since several of the ETM values for nearshore species are relatively high (up to 32% for clinid kelpfishes), and related monitoring data indicate potential population declines, staff believes that the intake system causes an adverse impact on nearshore species. (at 4)

Recent state studies show that the use of OTC by power plants contributes to the degradation of estuaries, bays, and coastal waters. OTC removes and kills vast numbers of marine organisms by impingement of adult fish and shellfish and by entrainment of larvae and eggs from fish and shellfish. There are also thermal impacts from discharging heated cooling water back into the sea. Most impacts are to early life stages of fish and shellfish, i.e. larvae and eggs. The magnitude of these impacts and their effects are largely unknown due to a lack of adequate and standardized studies, chiefly regarding entrainment. (Briefing report: Once-Through Cooling by Power Generators, June 13, 2007, <http://cssrc.us/publications.aspx?id=2738&AspxAutoDetectCookieSupport=1>)

**The detrimental environmental effects of OTC system are cumulative, and the revisions to the draft OTC policy must not condone its continued use.** DCNPP is one of 19 power plants in California which use OTC

technology, creating significant 'cumulative impacts.' Cumulative impacts are defined by the NRC:

Cumulative impacts on the environment result when impacts of an action are added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually small impacts that become significant when taken collectively over a geographic area or a period of time. (U.S. NRC Frequently Asked Questions on License Renewal of Nuclear Power Reactors, at 4-25, [http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1850/sr1850\\_faq\\_lr.pdf](http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1850/sr1850_faq_lr.pdf))

The California Energy Commission (CEC) explains the significance of cumulative impacts:

The term *cumulative impacts* refers to those impacts that result from many detrimental factors acting on a population simultaneously. This could be one OTC plant plus commercial fishing, pollution, and habitat degradation, or many OTC plants operating in the same area and drawing from the same

source water body. The reason for concern regarding cumulative impacts is that most entrainment studies take into account only the impact potentially caused by the plant itself. But, this impact is not placed within the context of other ongoing impacts that may or may not make the population more vulnerable to losses, or more likely to be seriously harmed by losses. Cumulative impacts remain virtually unknown and completely unstudied in the context of any California OTC plants, and this remains an area of research need. (Understanding Entrainment at Coastal Power Plants: Informing a Program to Study Impacts and Their Reduction; prepared for California Energy Commission, March 2008, CEC-500-2007-120, at 22, <http://www.energy.ca.gov/2007publications/CEC-500-2007-120/CEC-500-2007-120.PDF>)

Peter Raimondi's written comments at a CRWQCB meeting in May of 2003 makes a strong statement regarding the severity of such impacts:

An argument is usually raised that if such losses are spread over... large areas then the impact is small. This is simply wrong thinking. Coastal ecosystems around the world have been ravaged as a result of the implicit assumption that diffusion of impact is the solution. Thinly spread impact add up and it is one of the most insidious traits of such impacts that they can rarely be demonstrated. (CRWQCB Staff Report for Regular Meeting of March 21, 2003, at 4, [http://www.waterboards.ca.gov/centralcoast/water\\_issues/programs/diablo\\_canyon/docs/07\\_10\\_03\\_hearing/testimony/071003dr\\_raimonditestimony.pdf](http://www.waterboards.ca.gov/centralcoast/water_issues/programs/diablo_canyon/docs/07_10_03_hearing/testimony/071003dr_raimonditestimony.pdf))

**Best Available Technology exists, and the Federal Clean Water Act requires it. The revisions to the draft**

**OTC policy must enforce it. SLOMFP objects to Section L revision of the OTC policy, pages 3-4.** The

intent of the Global Warming Solutions Act of 2006 is not to trade one form of environmental impact for another. The two nuclear facilities can implement BTA to reduce the negative effects on the ocean and continue to operate.

The Federal Clean Water Act addresses and attempts to minimize OTC's adverse impacts.

On February 16, 2004, USEPA published rules applicable to cooling water intake structures at existing power plants. The rules establish performance standards of reducing impingement by 80-95% and reducing entrainment by 60-90% relative to a facility with minimal controls. Five major compliance options are identified: [1] reduction of water intake consistent with a closed-cycle recirculating cooling system; [2] reduction in the maximum through-screen design intake velocity to 0.5 feet per second, or less; [3] demonstration that the existing design and operational measures meet the performance standards; [4] demonstration that the facility meets a pre-approved design and construction technology; or, [5] a site-specific demonstration, based on cost considerations, of best technology available to minimize adverse environmental impact. Although there is uncertainty about how the Regional Boards will implement the new standards here, the deadline for power plant owners to comply is January 1, 2008. The new standards will cause significant compliance costs, i.e., rate increases and potential load interruptions. (Briefing report: Once-Through Cooling by Power Generators, June 13, 2007, <http://cssrc.us/publications.aspx?id=2738&AspxAutoDetectCookieSupport=1>)

SLOMFP contends that there are steps that nuclear-fueled power plants could and should employ.

There are two potential ways of addressing entrainment losses:

1. Intake Structure Technologies

- a. Screening or filtering systems
- b. Changing the intake location

2. Reduced Cooling Water Volume Withdrawal

- a. Variable speed pumps
- b. Seasonal flow limitations
- c. Closed cooling systems (cooling towers, dry cooling)
  - I. Wet Cooling (saltwater or freshwater)
    - a. Mechanical Draft Cooling Towers
    - b. Natural Draft Cooling Towers
  - II. Dry Cooling
    - a. Air Condensers
  - III. Hybrid Cooling (saltwater or freshwater)
    - a. Mechanical Draft Towers and Air Condensers Combined at 13

(NPDES Order RB3-2003-0009 July 10, 2003 Attachment 4, page 10,  
[http://www.waterboards.ca.gov/centralcoast/water\\_issues/programs/diablo\\_canyon/docs/07\\_10\\_03\\_hearing/071003\\_attachment4\\_entrainmentfindings.pdf](http://www.waterboards.ca.gov/centralcoast/water_issues/programs/diablo_canyon/docs/07_10_03_hearing/071003_attachment4_entrainmentfindings.pdf))

The CEC also lists ways of implementing technology to reduce entrainment:

- Moving the intake.
- Installing variable speed pumps.
- Installing barriers or screens in front of the intake.
- Installing fish bypass systems (for impingement).

(Understanding Entrainment at Coastal Power Plants: Informing a Program to Study Impacts and Their Reduction; prepared for California Energy Commission, March 2008, CEC-500-2007-120, at 27,  
<http://www.energy.ca.gov/2007publications/CEC-500-2007-120/CEC-500-2007-120.PDF>)

And again:

Alternative cooling methods can greatly reduce or eliminate the impacts of OTC. Dry cooling, using air cooled condensers or direct dry cooling, recirculating cooling using cooling towers and using wastewater for cooling, are all effective alternatives. (Briefing report: Once-Through Cooling by Power Generators, June 13, 2007,  
<http://cssrc.us/publications.aspx?id=2738&AspxAutoDetectCookieSupport=1>)

**SLOMFP objects to Revision B (2) Final Compliance Dates (page 6).** What is the usefulness of a final compliance date if it is not final? Allowing further delays and suspensions is a mockery of the policy.

**SLOMFP objects to Sections 7, 8, 9 (pages 12-13).** SLOMFP opposes the concept that mitigation elsewhere makes environmental impacts acceptable. This model contradicts the intent of the Clean Water Act to rectify the problems with the OTC system.