316 (b)
Once Through Cooling
Deadline: 9/15/06 5pm

California Council for Environmental and Economic Balance
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September 15, 2006

Song Her, Clerk to the Board
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

RE: CCEEB Comment Letter – Proposed Statewide Policy for Once-Through Cooling

Dear Song Her,

The California Council for Environmental and Economic Balance (CCEEB) is a non-partisan, non-profit organization of business, labor and community leaders that seeks to achieve the State's environmental goals in a manner consistent with a sound economy. On behalf of CCEEB I want to thank the State Water Resources Control Board (the board) for this opportunity to submit comments regarding the staff's "Proposed Statewide Policy on Clean Water Act 316 (b) Regulations" (Proposed Policy / Scoping Document).

CCEEB's membership includes most of the companies that represent the owners of the power generating facilities that utilize once through cooling ("OTC") systems and that are affected by this proposed policy. These companies, including SCE, LADWP, NRG, LS Power, PG&E, Mirant and Reliant are submitting detailed comments. In addition, EPRI/Tenera are also submitting detailed comments. Rather than duplicate these detailed comments in this letter, CCEEB incorporates the comments and concerns submitted by the above named entities by reference.

The summative comments of this letter are submitted in compliance with the board's extended deadline of September 15th. The board is likely aware that the expected ruling in Surfrider Foundation et al. v. EPA addressing the Phase II Rule has not yet been issued. Since the outcome of that case will impact various aspects of the Proposed Policy and will likely become the basis for additional comments, CCEEB suggests that the board anticipate this event and allow extended public comment for a reasonable period after the opinion is issued.

Summary of CCEEB's Concerns

CCEEB's primary concerns about the Proposed Policy and the Scoping Document can be summarized as follows:

- **The proposed required entrainment performance reduction of 90% (with at least 60% by way of technology or operational control) vs. the federal 316 (b) Rule range of 60%-90% may be infeasible in many cases.** The choice of this top performance level appears arbitrary and unsubstantiated by technology feasibility studies and consideration of the variety of physical settings of the existing facilities and the different size, types, usage rates and cooling water needs of the different existing facilities. EPA established a performance range in order to account for the differences in performances of different technologies at different sites in different operational conditions. The Proposed Policy contains no justification for this choice of a performance level nor does the Scoping Document address the reasonably foreseeable consequences of not being able to meet it. The Proposed Policy also provides that at least 60% of the entrainment reduction must be achieved by technology or operational controls and that any residual performance deficit may be offset by mitigation. The federal Rule recognizes that even the low end of the range may be infeasible and/or inappropriate at certain sites.

- **The proposed required impingement performance reduction of 95% vs. the federal Rule range of 80%-95% may be infeasible in many cases.** The choice of this top performance level also appears arbitrary and unjustified. Again, the Proposed Policy identifies a high standard level instead of a range that may not be feasible in all situations. It does so without adequate consideration of the unintended, but reasonably foreseeable consequences of not being able to meet this standard. This outcome is magnified by the inability of a facility to use restoration as a means to meet the standard in appropriate circumstances.

- **The proposed limit of compliance options to structural and operational changes to meet performance standards severely restricts compliance ability.** Not allowing use of restoration for the first 60% reduction of entrainment and excluding it as an option altogether for impingement furthers the likelihood of the inability of a facility to comply in all instances. While CCEEB believes the federal performance range should prevail, any state imposed impingement standards and entrainment standards must provide the ability to scale restoration projects to meet any shortcoming after the implementation of technological and/or operational measures.

- **The proposed prohibition of any site-specific consideration vs. the federal Rule recognition of cost-cost and a cost-benefit test at individual sites is another overly stringent requirement of the Proposed Policy.** This limitation will with reasonable foreseeability create situations where compliance costs to

retrofit an existing facility will be significantly greater than the benefit and will threaten the ability of the plant to operate. In combination with the high level impingement and entrainment performance level requirements, this prohibition becomes a double hit that exacerbates the reasonably foreseeable potential that a facility will not be able to comply with the Proposed Policy. The federal Rule's site-specific alternative allows consideration of best technology available that is economically practicable to minimize environmental impact. The Proposed Policy's disallowance of any consideration of cost, feasibility and practicability is apparently based upon a statutory reference in §13142.5 (b) of the Water Code that new or expanded power plants use the best available technology feasible for minimizing the intake and mortality of marine life. Phase II of 316 (b) applies to existing plants, not new or expanded power plants. CCEEB believes that it is in the state's interest that this policy not deny existing power plant operators the ability to select and implement a compliance strategy that achieves the best environmental protection and/or mitigation without compromising the plant's ability to continue to operate.

- **The proposed specification of calculated baseline flow to the mean actual flow over the previous permit cycle vs. the federal Rule reliance on an existing facility's design flow is severely overly-restrictive and will disproportionately affect different facilities.** All existing OTC plants in California have design flows that support their maximum generation capacity. That said, a plant might be operated only a portion of the time during peak demand periods or to cover scheduled maintenance of other plants. At any point in time any existing plant may be called upon to operate at maximum design capacity. Therefore it is critical that any state policy be drafted so that all existing plants can be operated at maximum design flow and energy production capability. Past operational performance is not an accurate indicator of either future operations at an existing facility or future power demands. Any baseline requirement based upon historic flows will severely restrict the ability of non base-load facilities to meet the impingement and entrainment standards of the Proposed Policy and must be accompanied by a detailed analysis of the reasonably foreseeable consequences to continued plant operation and the availability and reliability of power to the state of California. The reliability and availability of power to California affects the state's ability to meet its commitments to other western states and has the reasonable foreseeability to affect the stability of the multi-state western grid.

- **The Scoping Document is devoid of any measure of environmental benefit of these incremental, yet immensely significant, differences between the Proposed Policy and the federal Rule.** It is incumbent on the board to identify in its SED the tangible and quantifiable benefits that a state 316 (b) policy will provide over and above that achievable through compliance with the federal Rule. References in the Scoping Document to US EPA economic data is inconsistent with the board's responsibility to analyze the reasonable range of economic factors that need to be addressed if a state 316 (b) policy is created. These factors

would include the reasonably foreseeable impacts on the reliability and stability of California's and other western states' energy supply, as well as reasonably foreseeable impacts on energy markets and ratepayers. These impacts must be considered in the context of the incremental environmental benefits that are anticipated to occur.

- **The Scoping Document ignores the reasonably foreseeable potential that many elements of this Proposed Policy might destabilize the state's electrical grid at periods of peak demand or during periods of scheduled maintenance of base-load plants when backup generation capacity is required.** Ignoring these serious potential impacts is inconsistent with the board's responsibility to consider all reasonably foreseeable impacts in its SED. As pointed out in this brief summary comment, there are numerous instances in the Proposed Policy that create a reasonable foreseeability that operators of existing power plants will face decisions to reduce power production or consider compliance strategies that are so costly that they might compromise the ability of the plant to continue to operate. The impact of these decisions has a reasonable foreseeability of negatively affecting the reliability and stability of California's electric grid and that of the other western states as well.

- **The Scoping Document disregards the reasonably foreseeable negative environmental consequences of the conversion to wet or dry cooling alternatives.** These negative environmental impacts will result from the necessitated greater use of fossil fuels to make up for the energy production lost because of the retrofit of alternative cooling methods at OTC facilities, to the extent that retrofit conversions to wet or dry cooling occur, and/or to the extent that plants may be shut down and the power is replaced with plants that make use of alternative cooling technology. This energy production penalty results from the lower efficiency of alternative cooling technologies compared to OTC. These impacts are discussed in greater depth in the attached CCEEB comment letters to the State Lands Commission dated February 7, 2006 and March 24, 2006 and are portrayed in the attached Summary of Impacts Associated with State Lands Commission Resolution on Once Through Cooling. In summary, the energy losses that would have to be made up because of alternative cooling retrofit ranges from 287 MW (if all plants converted to wet cooling) to 1724 MW (if all plants converted to dry cooling). Making up this energy loss would result in a statewide increase in NO_x emissions of between 167 and 1028 tons/yr and 27 to 167 tons/yr of PM_{10} and 311,000 to 1,914,000 metric tons of CO_2. Again, the range is a function of whether each facility retrofits to either wet or dry cooling. To help put the CO_2 emissions into perspective, this CO_2 impact is the equivalent of adding 77,000 to 478,000 mid-size passenger cars to California roadways. Similarly, the impacts in the South Coast Air Quality Management District from making up lost power range from 78 to 483 tons/yr NOx and 13 to 78 tons/yr in PM_{10}.

The Essence of the Proposed Policy

In essence, the Proposed Policy removes the elements of flexibility and site-specific considerations provided in the federal Rule. In doing so it severely restricts compliance options available in California. Realistically those reduced options become:

- Convert to closed cycle cooling (for facilities that operate the highest level of hours);
- Reduce cooling water flow and power generation capability (for facilities that operate fewer hours);
- Shutdown or replace generating facilities.

The net result of these features of the Proposed Policy are serious impacts to ratepayer cost of power, power supply and capacity, efficiency and reliability, as well as the transfer of reasonably foreseeable and quantifiable negative environmental impacts to other media (air).

CCEEB questions whether there is a net environmental benefit derived from greatly restricting options available in the current federal Rule that is significant enough to justify the expense and reasonably foreseeable potential negative consequences to the economy and environment in advancing this Proposed Policy. Clearly the authors of the Proposed Policy believe the Proposed Policy will increase the benefits of the federal Rule to California's marine life, but the Scoping Document has not attempted to demonstrate what that incremental benefit may be. Nor has the Scoping Document considered the high potential and reasonably foreseeable negative environmental and economic consequences of doing so.

Also, as pointed out in the comments of others, there is a significant question of the extent and nature of the board's statutory authority to adopt a policy more stringent than the federal Rule and under what circumstances it may do so. Certainly the procedural and analytical safeguards of CEQA, as applied by the board through a SED is minimally required. The published Scoping Document is severely lacking in this regard. This lack of rigor in attention to required environmental assessment and evaluation needs to be addressed as the board moves forward. California can ill afford to create another MTBE episode in which the pursuit of one noble environmental goal damages other environmental media and, in this case, potentially damages the reliability and stability of the western states' electric power supply as well.

CCEEB Suggests A Different Approach

For the past year, CCEEB has requested the board to provide guidance that would promote continuity and consistency across the state as Phase II of the federal Clean Water Act § 316 (b), affecting existing facilities, is implemented. We would like to renew this request. Rather than consider adoption of a competing California "policy" to the federal Rule that has the reasonably foreseeable potential to be highly disruptive while providing

minimal, if any, net environmental benefit, CCEEB urges the board to assist in the implementation of the federal Rule.

The federal Rule is the result of years of effort by the US EPA. During this time many studies were reviewed, numerous technologies and their performance were investigated and the views and advice of countless scientists and technical experts was sought and considered. The federal Rule is designed to provide a uniform, technology-based approach that places all existing power plants subject to the Rule on a level playing field. Implementation of the federal Rule, as written, will provide a high level of environmental protections in a feasible and cost-effective way. Attempting to selectively remove provisions of flexibility and ranges of performance from the federal Rule that was designed to allow all existing plants to comply is inappropriate. Further, it is inconsistent with the board's responsibility for it to continue to ignore cost-effectiveness and cost benefit considerations and reasonably foreseeable economic impacts and impacts to the state's energy system and to other western states' electrical stability.

Implementation of the federal Rule is well underway. Lengthy and detailed entrainment and impingement characterization studies are underway. Plant operators will soon submit Comprehensive Demonstration Studies (CDS) to the Regional Boards. The boards will have to consider the details of these CDS to decide how to proceed. Plant operators can propose approaches to comply with the Rule, but ultimately the regional boards must approve these actions and amend each NPDES permit. Along the way we expect many questions to arise regarding concepts such as "substantially the same as" or "significantly greater than". Verification and ongoing monitoring will also be important issues. CCEEB believes the state would benefit from consistent interpretation of these implementation issues across the different regions.

Proceeding in this fashion would give the board the ability to bring a positive unifying influence to the implementation of this Rule in California. With an eye to the future, the board can identify emerging issues and provide guidance to the regional boards so that the intended biological benefit of the federal Rule is achieved in a manner consistent with other state objectives.

CCEEB strongly discourages the board from continuing to develop a Proposed Policy inconsistent with the federal Rule. However, if the board decides to continue work on this Proposed Policy CCEEB strongly recommends a series of workshops that fully explore each of the issues raised in this and other comment letters so that the board and staff clearly understand the implications to California of the Proposed Policy inconsistencies with the federal Rule. To that end, CCEEB would expect the board to fully and completely pursue its CEQA responsibility and perform a robust SED.

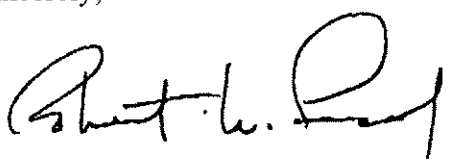
Concomitant with that work, CCEEB would expect the board to hold workshops and solicit comment on such topics as: entrainment and impingement characterization studies, appropriate baseline criteria, the availability and suitability of technology for Pacific coastal application, the role of mitigation, impacts to other environmental media of retrofitting existing facilities to alternative cooling technology, global warming

impacts and consistency of the Proposed Policy with AB 32, impacts to the California and western states' electrical grid etc.

USEPA diligently studied these issues for many years; surely the board can invest the time required to fully grasp the implications of the current policy path proposed by this Proposed Policy and Scoping Document. The single workshop on the Scoping Document on July 31st just scratched the surface of the rainbow of issues that needs to be individually identified and completely understood before action is taken on a state policy at odds with the federal Rule. Each element of concern expressed by these comments needs to be thoroughly examined and understood in light of the best interest of the state and its environmental and economic resources.

CCEEB appreciates this opportunity to comment on the Proposed Policy and Scoping Document. If you have questions or would like to discuss these comments in greater detail please contact me at 916-444-7337. Thank you for considering CCEEB's concerns.

Sincerely,



Robert W. Lucas

cc: Chair and Members of the State Water Resources Control Board
Celeste Cantu, Executive Director, SWRCB
Susan Kennedy, Chief of Staff, Office of The Governor
Brian Prusnek, Deputy Cabinet Secretary, Office of The Governor
Linda Adams, Secretary, Environmental Protection Agency
Dan Skopec, Undersecretary, Environmental Protection Agency
Mike Chrisman, Secretary, Resources Agency
Michael Peevey, Chair, Public Utilities Commission
Jackalyne Pfannenstiel, Chair, Energy Commission
Karen Edson, Vice President for External Affairs, ISO
Mary McDonald, Director of State Affairs, ISO
Victor Weisser, President, CCEEB
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California Council for Environmental and Economic Balance

February 7, 2006

Paul D. Thayer
Executive Officer
State Lands Commission
100 Howe Avenue, Suite 100-south
Sacramento, CA 95825

RE: Comments on staff proposed Resolution Regarding Once Through Cooling in California Power Plants

Dear Mr. Thayer,

The California Council for Environmental and Economic Balance (CCEEB) is a non-partisan, non-profit organization of business, labor and community leaders that seeks to achieve the State's environmental goals in a manner consistent with a sound economy.

CCEEB's membership includes companies that represent over 75% of the owners of the power generating facilities that utilize once through cooling ("OTC") systems. Such companies will be impacted by the Proposed Resolution Regarding Once Through Cooling in California Power Plants scheduled for consideration at the February 9th Commission meeting. These CCEEB members wish to express their viewpoints associated with the use of OTC systems in California. CCEEB urges your reconsideration of the proposed resolution and requests the Commission to defer action until such time that it is fully informed of the potential consequences of implementation of this resolution as drafted.

Power plants utilizing OTC systems play an extremely important role in powering California and its economy by generating efficient and reliable electricity. In fact, 21 power plants producing approximately 24,000 megawatts utilize this efficient cooling technology in California, which represents approximately 40% of the total electrical generating resources in California. Many of these coastal power plants are also located in the heart of the electrical load centers of California, thereby providing critical local and regional electrical grid reliability services.

California is Currently Addressing Once Through Cooling Through Implementation of US EPA's Phase II 316(b) Regulation

US EPA spent nearly a decade developing the Phase II 316(b) regulation that now applies to power plants utilizing OTC systems. The rule targets very substantial reductions in impingement and entrainment levels at power plants, while also retaining the needed flexibility to meet the reductions in a feasible and cost effective manner. Statements that OTCs are a significant source of adverse impacts to California's coastal marine biology and ecology are inconsistent with the data that has been collected during almost three decades of operations of these facilities. The section of this letter entitled "Impacts of Once Through Cooling Systems are Not Biologically Significant" describes the evidence from recent and historical impingement and entrainment studies, from which the weight of the findings show that OTCs are not causing significant impacts to fish populations. It is therefore premature to decide that implementation of 316(b) is not the right balance of environmental protection and cost effective power production, as its full implementation is not yet realized. California should only consider a different approach if the Phase II 316(b) is proven to be insufficient for California's needs or goals.

Compliance with the Phase II 316(b) regulation is in full swing in California, with many of the mandatory steps already being completed by the regulated facilities. Those steps include recent and comprehensive impingement and entrainment studies at each of the facilities and an evaluation of the Phase II 316(b) compliance options, including the feasibility of technological solutions to meeting the impingement and entrainment standards. CCEEB is concerned that a new or different state policy as proposed by this Proposed Resolution at this stage will only serve to provide uncertainty and delay implementation of the federal regulation and most likely delay the desired end result, which is to see significant reductions in impingement and entrainment.

The State Water Board is providing valuable oversight and authority in the state's implementation of the federal 316(b) regulation. CCEEB believes the most appropriate state action is for the Board to provide specific guidance on key provisions of the regulation. In that way, the State Water Board can ensure implementation of the regulation is carried out in a consistent and efficient manner throughout the state. However, such guidance should be developed to stay within the bounds of the federal 316(b) regulation and to

not limit compliance flexibility for the facilities. This proposed Resolution undercuts the State Board's responsibility to implement 316(b) regulations in a balanced and thoughtful manner by stating the Lands Commission's intent to not extend existing leases or issue new leases after 2020.

Impacts of Once Through Cooling Systems Are Not Biologically Significant

Several staff members of the California Energy Commission and California Coastal Commission have joined with a number of environmental groups advocating the closure of coastal power plants claiming evidence of enormous damage to coastal fisheries and ecology.[1] However, both the facts and findings of recent assessments of California coastal OTC intakes provide strong evidence to the contrary, finding that OTC systems have not damaged coastal fisheries or other resources, and also have demonstrated an absence of risk to California's present and future populations of entrained organisms and to the beneficial uses of California's coastal water.

Every five years the Regional Water Quality Control Boards ("RWQCB") review the NPDES permits for use of the intake water in OTC systems. Initial, and often recurring, impingement and entrainment evaluations were required at facilities utilizing OTCs back in the early 1980's, which demonstrated these systems were not causing significant adverse impacts to marine ecosystems. In recent years, the interest and activities surrounding proposals for the installation of new generating technology for improved efficiency has provided a large amount of contemporary information on the effects of impingement and entrainment at the state's existing OTC intakes. A great deal more of this kind of information is also available as a result of information gathering requirements in EPA's new Phase II 316(b) compliance and performance standards (see Table 1 below).

At every one of the facilities with data from previous intake studies that demonstrated no adverse impacts, the recent studies also demonstrated an absence of present day damage and found the source water communities of entrained fish and invertebrate larvae were remarkably unchanged[2,3]. Independent scientists consulting to the RWQCB made specific findings of this nature in their final review of the Moss Landing 2000 & 2001 316(b) studies of the Elkhorn Slough, Moss Landing Harbor, and Monterey Bay

[1] See for example public comments from Mr. Tom Luster (CA Coastal Commission) at the SWRCB workshop in Laguna Beach, September 26, 2005.
[2] Moss Landing Power Plant 316(b) Study
[3] South Bay Power Plant 316(b) Study

source water in comparing them to their own study findings from 1977, a period of nearly three decades.

The California Department of Fish & Game has stated in its Nearshore Fisheries Management Plan that an over-fished stock is one that has been reduced to 30% of its unfished biomass and that controls would need to be enacted whenever a stock is reduced to 60% of its unfished biomass. The designs of recent entrainment studies are based on similar principles of fishery management and provide estimates of the numbers entrained organisms as a percentage of the total larvae at risk of entrainment (source water populations). In 316(b) studies of OTC systems, the entrained fraction of the source water population of larvae usually averages between 2 and 10 percent of the estimated source populations and is much lower for most species. The 2 to 10 percent average entrained fraction represents very small impacts to adult fish due to the high natural mortality of larval fishes exceeding 99.9 percent.

The statements of significant impacts from OTC systems are often centered on the large numbers of larvae that are entrained as the only evidence needed to assume that there has to be ecological damage. However, as demonstrated by 316(b) studies, these losses of larvae are very small fractions of the source water populations of the larvae, which are present in enormous numbers in the ocean and bays (see Table 1 below). Further, the fractional losses caused by entrainment are insignificant to sustaining the adult populations of the fish relative to the levels used for fishery management, especially when more than 99.9 percent of the larvae will die naturally before becoming adults with absolutely no affect on the size of the adult fish populations. For many, this scientific fact of population dynamics, which is used to regulate and assure sustainable harvests of natural populations, is difficult to comprehend or is philosophically at odds with their ideas of preservation.

Table 1 – Summary of Entrainment Impacts from Select OTC Studies

Facility Name	Adult Equivalent Losses as a Percentage of Adult Source Water Populations	Average Proportional Entrainment Mortality as a Percentage of Source Water Larval Populations	Study Year
El Segundo	0.10 – 0.76 %	NA	1980
Huntington Beach	NA	0.6 %	2004
Diablo Canyon	NA	8.6 %	1996-1999
SONGS	0.01 – 6.9 %	NA	1979-1986
Moss Landing	NA	13.1 %	1999
Morro Bay	NA	21.0 %	2000
Scattergood	0.001 – 0.2 %	NA	1981
Harbor	0.8 – 1.8%	NA	1981
Haynes	NA	NA	1981
South Bay	NA	13.4 %	2001

The numbers of larvae produced by most fishes during their reproductive years as adults can be enormous, but only two of those larvae need to survive to adult to maintain a stable population level. For example, a single California halibut may release as many as 50 million eggs per year over a period of greater than 20 years, and a single rockfish may release up to one million larvae per year for several years to decades depending on the species. Other species such as gobies produce only a few thousand larvae per year per adult female over a much shorter lifespan, but even in these fishes, the total lifetime survival rate required to maintain the population is less than 0.1%. The incremental losses of larvae due to OTC systems do not have any measurable effect on fish populations because they are adapted to living and reproducing in highly variable environments where the natural rates of mortality are very high and vary from year-to-year. The arguments presented by some staff at the California Energy Commission and California Coastal Commission and members of the environmental protest groups ignore the role of compensation (density dependent predation and recruitment) in maintaining these populations.

On the Pacific coast, evidence showing that high numbers of entrained larvae do not result in large impacts includes the following:

- Even though gobies are entrained in greater numbers than any other fish larvae, studies at the South Bay Power Plant showed very little change in annual estimates of goby larvae entrainment between studies in 1979–1980 and studies in 2001 and 2003. The absence of any long-term changes in larval productivity is supported by abundance data on adult gobies that showed increases in the population through time from 1994-1999.
- Although recent studies at the Encina Power Station show that goby larvae are entrained in higher numbers than other fishes, studies on adult gobies in Agua Hedionda Lagoon (where the Encina intake is located) showed much higher adult densities of gobies than similar studies from Batiquitos Lagoon where no power plant is located.
- Long-term monitoring in central California at the Diablo Canyon Power Plant, with an OTC volume of 2.5 billion gallons per day, showed no significant declines in nearshore fish populations over the 20 years of plant operation.

Implementation of Phase II 316(b) Requirements Will Significantly Reduce Impingement and Entrainment at OTCs

Compliance with US EPA's Phase 316(b) performance standards requires reduction in impingement and entrainment at OTC systems even though these systems are not causing significant impacts to fish populations. The target reductions of 80 to 95 percent of impingement mortality and 60 to 90 percent of entrainment at all California's coastal facilities will, with very little uncertainty, assure the future protection of the beneficial uses of the source waters. If we have no evidence of damage to these uses over nearly three decades of operation, and recent assessments have determined that entrainment losses are below the levels allowed for sustainable harvest (as described above), then the significant reductions in these losses required by US EPA's new rule will ensure that OTC systems will have no significant effects on populations of fish, shellfish and other wildlife.

Existing State Policy Encourages the Use of Seawater for Power Plant Cooling For Many Compelling Reasons

Established policy of the State of California {California Water Code Section 13550 *et seq*., and State Water Resource Control Board Resolution 75-58} encourages the siting of power plants on the ocean in order to take

advantage of the state's abundant seawater as a supply for power plant cooling in order to conserve the state's finite and limited supplies of freshwater for other purposes. Alternative cooling systems to OTC require the use of substantial quantities of freshwater and/or having impacts to other environmental media, thereby providing many reasons why this remains a good policy for California, including:

- Once-through cooling systems are the most energy efficient form of cooling for power plants as compared to alternatives, including wet or dry cooling towers. Wet and dry cooling systems have been demonstrated to have moderate to large reductions in power plant thermal efficiency (energy penalty) when compared to OTC. EPA estimates efficiency losses would be approximately 2.4 to 5.3 percent from wet cooling and 8.6 to 10 percent from dry cooling as compared to OTC systems (July 9, 2005 Federal Register, page 41605; and EPA Technical Development Document, Chapter 5). This loss of power plant thermal efficiency translates into reduced power production when using the same fuel rates;

- The wet/dry cooling energy penalty noted above requires more fuel use to achieve the same number of megawatts of power as OTC systems. This increased fuel use causes increases in emissions of air contaminants that are avoided with use of the more efficient OTC systems. It also increases the cost to produce the power;

- Use of wet cooling towers has been demonstrated to cause emissions of particulates that are not created with use of OTC systems;

- OTC systems avoid the use of large volumes of potable or reclaimed water typically used for wet cooling towers. Use of seawater in OTCs maintains larger available resources of potable and reclaimed water for other important uses and reduces the need to tap into additional potable water sources;

- Not using large volumes of potable water at power plants avoids the many environmental impacts associated with use of such water sources, including the storage of water, water transportation, groundwater pumping, impacts to lake, river, and stream fish and habitats, etc;

- OTC systems are low profile cooling systems and avoid the visual impacts associated with the comparably large-sized wet or dry cooling towers, both from the physical structures themselves and from vapor plumes from wet towers. Because power plants that use OTC systems are often in constrained coastal areas, use of wet or dry cooling towers may be prohibited due to local visual resource issues or unavailability of the necessary real estate;

- OTC systems avoid the significant noise impacts normally associated with wet or dry cooling towers;

- OTC systems make possible the synergies of a co-located desalination plant to utilize a single seawater intake structure to efficiently use seawater for power plant cooling and desalination for production of critically needed additional potable water supplies for California;

These benefits associated with the use of OTC systems are often over-looked when discussing OTC systems. Further, the state's list of approved water quality basin plans for bays and estuaries explicitly recognize the compatible, beneficial use of the water for industrial cooling water. For these reasons, the existing state policies of encouraging the use of seawater for industrial cooling purposes remains a good and environmentally sound policy for California.

Detailed EPA Review Concluded that Wet and Dry Cooling Retrofits are not Economically Practicable for Existing OTC Systems

During the September 26, 2005, State Water Board OTC Workshop, several public comments urged the Board to require retrofit of OTC systems to wet or dry cooling technology. While these technologies are certainly good methods of cooling for newly constructed power plants, they have serious and significant technical hurdles associated with being retrofitting onto existing power stations. Some of those issues can be summarized as:

- Since each of the 21 California power plants using OTC systems are located on, or in close proximity, to the coast (either ocean, bay, or canal), the very large required space for installing wet or dry towers is often not available at these locations;

- As pointed out earlier, retrofitting to wet or dry cooling towers can cause new and different environmental impacts. For example, wet cooling towers directly emit particulate matter emissions to the air, which can impact ambient air quality. Secondly, wet or dry cooling reduces the thermal efficiency (energy penalty) of a power plant, thereby requiring it to combust more fuel and emit more air emissions in order to generate the same amount of power as an OTC. The same holds true for dry cooling, which even has an even greater reduction in thermal efficiency associated with its use than wet towers;

- Wet and dry cooling towers tend to not meet coastal development requirements by causing potentially significant adverse impacts to visual resources and increase the noise footprint compared to facilities that utilize OTC systems;

- Wet cooling towers require the use of significant volumes of freshwater, which puts additional strain on the already severely limited freshwater sources for California. Even using reclaimed water for wet towers has an impact on freshwater sources since that reclaimed water cannot be used to offset some other more appropriate freshwater user;

- Wet and dry cooling retrofits at existing OTC facilities are very expensive. For example, the San Onofre Nuclear Generating Station ("SONGS") evaluated retrofit costs to these two cooling methods and found retrofit costs of dry cooling to be approximately $500 million and wet cooling to be $370-450 million, depending on the type of wet cooling utilized. These represent just the capital and construction costs associated with these technologies. EPA estimated the average cost of retrofitting to wet cooling to range from $130 to 200 million for higher flow facilities, but noted the estimates did not fully incorporate costs associated with acquiring land needed for these large cooling structures (July 9, 2004 Federal Register, page 41605). As noted before, there are additional and substantial costs associated with de-rating the generating units, reduction in thermal efficiency, higher operations and maintenance costs, etc. that are not included in these estimates.

Assuming implementation of this proposed Resolution and that wet or dry cooling retrofits were required at all 21 California facilities currently operating with OTC systems (approximately 24,000 megawatts), and using the above

noted retrofit cost estimates and average estimated thermal efficiency losses, the following impacts to the state's power generation capacity would result:

- Total capital costs for wet or dry cooling retrofits would be $1.1 to 4.2 billion;

- Retrofit to wet cooling would create thermal efficiency penalties roughly equivalent to 925 megawatts of lost power generating capacity (approximately two large scale combined cycle power plants);

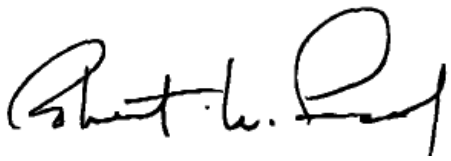
- Retrofit to dry cooling would create thermal efficiency penalties roughly equivalent the 2200 megawatts of lost power generating capacity (approximately one of California's nuclear power plants or four to five large scale combined cycle power plants).

US EPA recognized these significant and serious costs and issues and concluded that it would not require Phase II 316(b) facilities to have to consider retrofitting to wet or dry cooling as part of the Phase II 316(b) regulation (July 9, 2004 Federal Register, pages 41605 and 41608). CCEEB believes California should apply the robust set of EPA's information and findings to come to the same conclusion and not require a wet or dry cooling alternative for these OTC facilities.

In sum, this letter attempts to address some of the many complex environmental and economic issues that must be considered in any public policy statement on the topic of once through cooling. It does not attempt to describe the impact to California's energy supply or to the stability of the grid should some or all of the existing or planned, but not yet built, plants are closed because of an inability to operate after 2020. Nor does it attempt to estimate how this policy will affect investment decisions that will most certainly need to be made between now and then.

The Council thanks the State Lands Commission for its thoughtful consideration of CCEEB's viewpoints and recommendations. If you have any questions do not hesitate to call me at (916) 444-7337 for further discussion.

Sincerely,



Robert W. Lucas

cc: Members of the State Lands Commission

California Council for Environmental and Economic Balance
100 Spear Street, Suite 805 San Francisco, CA 94105

March 24, 2006

Mr. Paul D. Thayer
Executive Officer
State Lands Commission
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825

RE: Comments on Staff Proposed Resolution Regarding Once Through Cooling in California Power Plants

Dear Paul,

On February 7, 2006, I wrote to you on behalf of the California Council for Environmental and Economic Balance (CCEEB) to express its concerns regarding the State Lands Commission's proposed resolution (Resolution) that states that the Commission will not approve new leases and extensions of existing leases of facilities that use Once Through Cooling (OTC) after 2020. That letter provided information regarding why the impacts of OTC systems are not biologically significant, described the stringent requirements of the US EPA Phase II 316(b) regulation which will significantly reduce impingement and entrainment at existing OTC systems, and also provided general information about the significant energy, economic, and environmental impacts associated with use of alternative cooling systems in place of OTC systems. CCEEB believes that information represents compelling evidence to not move forward with the proposed Resolution. Further to those points, CCEEB would like to provide detailed analyses and conclusions about the energy, environmental, and economic consequences that would occur should the proposed Resolution be approved.

CCEEB has compiled physical and operational data from publicly available sources on each of the affected power plants. This information was then assessed to better understand each site's capability (if any) to be retrofit with either closed cycle wet cooling towers (wet cooling) or air cooled condensers (dry cooling), the energy efficiency penalty associated with each alternative cooling source, the increased emissions of NOx, PM 10 and CO2 that would result by making up for the lost power associated with the efficiency penalties by burning more fossil fuels, and the new potable or reclaimed water that would be required

for water tower cooling. The attached tabulation displays this information along with notes that guide the reader through the methodology and assumptions as well as a statewide summary tabulation that also breaks out likely impacts in the South Coast Air Quality Management District area.

The negative impacts on energy, environmental quality, climate change, and natural resource which would occur upon implementation of this ban of OTC systems are significant and compelling to say the least. These troubling adverse impacts would be accompanied with higher costs for California consumers and businesses. We agree with statements made by representatives of the Energy Commission that these impacts should be considered on a case-by-case basis. We believe this would otherwise occur in the absence of this Resolution through normal procedures of the State Lands Commission as it applies CEQA to each application for a new or renewed lease. We recognize the limits of the information upon which the attached calculations were based, but in the absence of a complete CEQA analysis of the impacts of this Resolution, we thought it was essential for someone to compile this information and provide it to the State Lands Commission so it can be informed of the consequences of its pending action on this item.

In summary, this proposed resolution would impact 21 coastal power plants that represent 45% of in-state power generation capacity. Though four of these plants will retire or have near term shutdown commitments, approximately 67% of the active plants do not appear to have the capability to changeover to alternative cooling because of on-site space constraints or surrounding incompatible land use. As pointed out at the February State Lands Commission meeting, some of these plants operate at a low operating capacity factor as peaking units, however all of the 20,759 MWs of existing operating capacity from these plants is needed during critical peak demand periods. As such, the state can ill afford any of these plants to be shut down because the plant cannot physically accommodate alternative cooling. Yet, that remains a very possible outcome of this resolution if it is passed as proposed.

Even if one were to assume that all plants are able to be feasibly retrofit with wet or dry cooling alternatives, the capital cost to retrofit all of these facilities ranges from $2.0 Billion for wet cooling to $2.5 Billion for dry cooling. Additionally, retrofit to each of these alternative cooling technologies would create an energy efficiency penalty of a value dependent upon whether wet or dry cooling was used. Replacing the lost generation capacity to make up for the efficiency penalty would also require significant capital expenditure ranging from $290 Million for wet cooling penalties to $1.7 Billion for dry cooling penalties. Therefore the total capital cost impacts associated with retrofit and associated energy penalties ranges from $2.3 Billion to $4.2 Billion.

When these efficiency penalty factors are applied to each plant, the resulting calculation provides our estimated range of impacts associated replacing that lost generation capacity to make up the energy lost from either wet or dry cooling alternatives. In summary, the energy losses that would have to be made up

because of alternative cooling retrofit ranges from 287 MW (if all plants converted to wet cooling) to 1724 MW (if all plants converted to dry cooling). Making up this energy loss would result in a statewide increase in NOx emissions of between 167 and 1028 tons/yr, 27 to 167 tons/yr of PM10 and 311,000 to 1,914,000 metric tons of CO2. Again, the range is a function of whether each facility retrofits to either wet or dry cooling. To help put the CO2 emissions into perspective, this CO2 impact is the equivalent of adding 77,000 to 478,000 mid-size passenger cars to California roadways. Similarly, the impacts in the South Coast Air Quality Management District from making up lost power range from 78 to 483 tons/yr NOX and 13 to 78 tons/yr in PM10.

Finally, if all of the units switched to wet cooling more than 20 Billion gallons/year of fresh or reclaimed water would be required to meet the cooling needs. This appears to be contrary to the best prudent use of these valuable water resources.

We believe the State Lands Commission should also consider that State Water Resources Control Board implementation of Phase II 316(b) compliance requires 80-95% reduction in fish impingement and 60–90% reduction in entrainment. The resultant impacts on adult fish populations from these entrainments would be negligible and accomplishing these reductions are estimated to cost 5-10% of the cost of retrofitting these facilities to wet or dry cooling and would avoid the energy, economic, and environmental impacts of those alternative cooling systems.

The Commission's proposed adoption of the Resolution also fails to comply with the state Administrative Procedures Act (APA) and the California Environmental Quality Act (CEQA). It is clear that the Commission intends that the Resolution establish policy that will be binding on the Commission as well as other governmental agencies and private parties. If adopted, the Resolution will necessarily affect the decisions of facility owners, operators, lenders and others, who will be reluctant to risk substantial investment decisions on either a future change in the Resolution or approval of a lease renewal despite the Resolution. Consequently, the Resolution is in reality a regulation, the adoption of which is subject to the APA. The Commission has not even attempted to satisfy the procedural and substantive requirements of the APA.

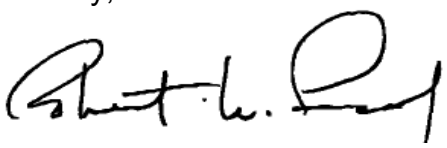
Adoption of the Resolution also independently qualifies as a "project" under CEQA. The information provided above and in our February 7 letter is more than sufficient to establish a fair argument that the Commission's adoption of the Resolution may cause a significant environmental impact. Thus, the Commission cannot adopt the Resolution until after it has prepared and certified an Environmental Impact Report that fully evaluates the environmental impacts of the Commission's proposed policy on once through cooling.

Considering the magnitude and extent of the negative impacts to energy production and cost, criteria pollutant and greenhouse gas emissions, increased fossil fuel and water resource use to preserve existing power plant operation at

today's levels- in addition to the added costs to consumers and businesses- which would occur as a result of this proposed ban on once through cooling, CCEEB again urges the State Lands Commission to reconsider this ban, revise the language in the proposed resolution accordingly and subject it to review pursuant to CEQA and in accordance with the requirements of the APA.

Thank you for your consideration of our concerns. If you would like to discuss these comments further, please contact me at 916-444-7337.

Sincerely,



Robert W. Lucas

Attachment

cc: Members of the State Lands Commission
Tam Doduc, Chair, SWRCB
Joe Desmond, Chair, California Energy Commission
Mike Chrisman, Secretary, Resources Agency
Victor Weisser, President, CCEEB
Jack Gualco, The Gualco Group

Summary of Impacts Associated with State Lands Commission Draft Resolution on Once Through Cooling:

General OTC Information:	
Number of Power Generation Facilities with OTC Systems:	21
Total Operating Capacity in MWs Using OTC Systems:	20,759
Percentage of CA In-State Power Generation Capacity that use OTC Systems:	45%
Range of Facility Generation Capacity Factors:	3.5% to 98%
Average Generation Capacity Factor:	25.5%
Number of Facilities Retired or with Near-Term Shutdown Commitments:	4
Percentage of OTC Facilities Where Alternative Cooling is Technically Infeasible:	67%

Impacts Associated with Retrofit to Alternative Cooling Systems:	Wet Towers	Dry Towers
Alternative Cooling Energy Penalty (Reduced Generation Capacity in MWs) Caused by Retrofit:	287	1,724
Statewide Increase in NOx Emissions (tons/year) from Replacing Lost MWhrs:	167	1,028
South Coast AQMD Increase in NOx Emissions (tons/year) from Replacing Lost MWhrs:	78	483
Statewide Increase in PM10 Emissions (tons/year) from Replacing Lost MWhrs:	27	167
South Coast AQMD Increase in PM10 Emissions (tons/year) from Replacing Lost MWhrs:	13	78
Statewide Increase in CO2 Emissions (metric tons/year) from Replacing Lost MWhrs:	311,491	1,914,837
Percentage Increase in CO2 Inventory from In-State Power Generation Sector to Replace Lost MWhrs:	0.7%	4.4%
CO2 increase to replace lost MWhrs is equivalent to CO2 from this many 4 tpy mid-size passenger cars:	77,873	478,709
Estimated Increase in Fresh or Reclaimed Water Use if Retrofit to Wet Cooling Towers (gallons/year):	20,427,747,169	-

Alternative Cooling Capital Cost Estimates (assumes technical feasibility):	Wet Towers	Dry Towers
Estimated Capital Cost to Retrofit All Operating Units to Alternative Cooling Systems:	$2,019,373,750	$2,502,034,376
Estimated Cost to Construct New Facility to Replace Lost MWs Due to Energy Penalties:	$286,612,000	$1,723,840,000
Total Estimated Costs to Retrofit with Alternative Cooling Systems & Replace Lost MW Capacity:	$2,305,985,750	$4,225,874,376

Phase II 316(b) Compliance Information:	
Required Impingement Reduction Standard	80-95%
Required Entrainment Reduction Standard	60-90%
US EPA's Calculated Capital Costs to Comply with Phase II 316(b) for CA Facilities:	$225,000,000
US EPA Cost Estimate as Percentage of Total Wet Cooling Retrofit Costs:	9.8%
US EPA Cost Estimate as Percentage of Total Dry Cooling Retrofit Costs:	5.3%
Did US EPA Find it Cost Effective to Require Retrofit to Closed Cycle Cooling in Phase II 316(b)?	NO