

Comments on Questions To Expert Review Panel in California State Water Resources Control Board Staff Scoping Document: Water Quality Control Policy on the Use of Coastal and Estuarine Waters For Power Plant Cooling, March 2008 Draft

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Comments on Questions for ERP

1. *How will baseline be defined?*
 - a. *for Track I*
 - b. *for Interim Measures*

This issue was not addressed in the current draft of the Scoping Document. The EPA Phase II Rule had a definition of baseline that provided credit for existing controls that applied to all power plants regardless of the compliance pathway selected. The SWRCB Policy should take the same approach and not have separate definitions for Track I or Track II compliance or any interim measures that might be implemented. The definition used in the EPA Phase II Rule should be used for the definition of baseline. The adoption of the same definition would reduce confusion and provide consistency with the Phase II Rule.

As an example, all of the power plants in California with offshore intakes have velocity caps that were installed to reduce impingement. The velocity caps have been shown to be very effective at reducing impingement and at some plants may meet the levels of impingement reduction required under the Phase II rule. Power plants should be able to take credit for these and other measures designed to reduce the potential effects of their cooling water intake systems.

The baseline should be calculated using the cooling water volumes currently permitted in the NPDES permits. This will allow plants that are currently operating at low levels to take credit for their current operating practices. This definition of baseline should include the exemption in the Phase II Rule for plants running at a capacity factor of less than 15%. This would largely exempt the low capacity units from having to install expensive

upgrades as long as their capacity factor remains below 15%. These older units only operate during peak demand and it will likely be very difficult to justify the costs of upgrading when the power is only needed 30-60 days per year. Also, the cost of power at the retrofitted plants is more than double the cost of the power at the older plants due to the capital recovery needed for the new generation. This exemption used in conjunction with a requirement for shutting off the main circulating water pumps during periods when the plants are not producing energy (discussed below in 3b) would provide flexibility for the existing older units, limit the increased costs of power due to implementing expensive controls at plants that are not operating the majority of the year, and ensure that any potential effects of OTC are reduced.

2. *Have current, statewide and individual power plant impingement and entrainment impacts been correctly estimated?*

The tables in the current draft of the Scoping Document present estimates of IM&E from studies at most of the CA facilities, but the estimates came from numerous sources using different flow conditions (design, actual, projected) making them difficult to compare and combine into a statewide estimate. I would recommend using the design and five-year average flows to estimate potential entrainment at each facility. These volumes would be multiplied by the larval fish concentration measured at the intakes for each facility to provide the estimated annual entrainment. This approach will provide a range for entrainment at each plant that could be compared across facilities.

Impingement is more problematic because, at many plants, the greatest impingement occurs during heat treatment events. Therefore, the total impingement during a year may be more related to the number of heat treatments than actual flow. Also, unlike entrainment that is highly correlated with cooling water flow volume, impingement is less dependent on flow, and may actually be more dependent on other factors. Therefore, estimates for impingement should be presented as an annual average based on impingement during normal operations, and an average per heat treatment with an estimate of the average number of heat treatments historically conducted at a plant each year.

3. *Are the proposed interim controls effective and feasible to prevent mortality and reduce takes of wildlife?*

a. *Tetrapod exclusion screens?*

The 4” mesh screen requirement presents a significant maintenance issue for the plants due to fouling and may actually result in increased impingement. The mesh will become fouled with debris occluding flow through the intake and increasing velocities in areas that remain unfouled. This is only an issue at a few of the power plants in California, specifically those in southern California with offshore intakes. The plants in protected

bays and harbors typically have metal bar racks usually with 3” of spacing between the bars that exclude large debris and organisms from the cooling water system.

The numbers presented in the following tables show the numbers of harbor seals, California sea lions, and turtles entrapped from several of the plants in southern California where this would be an issue. The numbers presented were taken from the incidental take permits filed for these facilities.

Facility	Period	harbor seals		CA sea lions	
		released	found dead	released	found dead
Diablo Canyon	1985-2001	0	0	0	0
Ormond Beach	1977-2000	20	13	8	27
Scattergood	1989-2000	1	0	4	35
Redondo Beach	1976-2000	14	7	4	8
Huntington Beach	1977-2000	2	2	2	7
San Onofre	1978-2000	105	64	63	153

Facility	Period	sea turtles	
		released	found dead
Diablo Canyon	1985-2001	7	0
Ormond Beach	1977-2001	1	0
Scattergood	1977-2001	5	0
Redondo Beach	1977-2001	3	1
Huntington Beach	1977-2001	0	0
San Onofre	1977-2001	29	4

As the data in the tables show, the entrapment of tetrapods at all of the plants except San Onofre amounts to only a few animals a year. The survival of many of the animals is due to the procedures in place at these plants to capture and release the animals once they are observed in the forebays of the cooling systems. If screening devices were installed on the intakes at these plants, seals, sea lions, and turtles would likely be trapped against the screens offshore and drown when they are unable to surface for air. This would likely result in increased levels of mortality that could not be quantified since the moribund animals would eventually decompose or fall off the screens when the cooling water pump flow is reduced.

b. Flow Reduction?

Requiring plants to shut down their circulating water pumps when the units are off-line for more than 2 days is an interim measure that best meets the intent of the policy to reduce the potential effects of OTC. This measure is especially effective if design flow is used as the baseline for evaluating compliance and the existing exemption in the Phase II Rule for plants operating at less than 15% capacity is maintained in the State Policy. Many units at California power plants are only producing power 30-60 days per year primarily during the summer months when demand is highest. If the cooling water pumps at these plants were not operating when they were not producing power, the desired environmental benefits would be achieved without requiring expensive upgrades. The objective behind the rule is to decrease impingement and entrainment due to OTC and the reductions achieved by flow reduction nearly meet the desired levels while not requiring expensive upgrades at plants that are only operating to meet summer peak demand.

c. Restoration

The concept of restoration as a mitigation option as originally proposed in the Phase II Rule would have provided benefits that far exceeded any of the potential effects of OTC. Unfortunately this option was eliminated in the Riverkeeper II Decision and no matter how desirable it would be to include as an option in a State Policy, it is difficult to see how it can be fairly implemented if it is only used as an interim measure as a precursor to the elimination of OTC. Once a restoration project is funded, the benefits of the project extend for as long as the restored area is maintained. It is usually not desirable to do a temporary restoration project.

A more flexible, and potentially more beneficial, approach could be based on an idea that was presented at the State Board workshop on OTC held at Moss Landing in August 2006 by David Abelson, a former CEC attorney. Plants would have to pay for cooling water usage over the levels set in the Track I and II compliance pathways. This would encourage implementation of the Interim measure for reduced cooling water flow and would allow some flexibility for the plants that are normally operating at a capacity factor of less than 15%, as per the Phase II Rule, to exceed that level during periods of peak energy demand. It would also provide a quantifiable financial incentive to implement controls that would ensure compliance with the desired levels of IM&E reduction if plant capacity significantly exceeded 15% on a regular basis. Some time period for compliance before the fees began accruing should be allowed similar to the schedule set in the existing Draft Policy. This time period would allow the power plants to weigh the costs of operating their existing OTC system against the costs of upgrades.

The money collected from the cooling water usage fees should go into a third-party fund administered by an Expert Panel that would consider proposals for restoration or other projects that would best mitigate the potential effects of OTC. The panel should also

consider proposals from power plants for technology implementation at a facility that could be shown to reduce the potential effects of OTC. These funds should only be provided as matching funds for technology implementation.

4. For Track I, are adverse impacts associated with conversion to closed-cycle cooling adequately considered?

No, and this is one area that was left open under the Second Circuit Court of Appeals decision. The impacts associated with closed-cycle cooling are well documented, but one impact that I was recently made aware of is the potential increases in air temperature in the vicinities of the structures. Atmospheric conditions in coastal areas result in inversion layers that will trap the heat released to the atmosphere from these systems. These effects would need to be modeled on a site-specific basis and would vary seasonally but could result in significant localized environmental effects, especially if the plant is located adjacent to agricultural or residential areas.

The impacts associated with closed-cycle cooling should be fully explored in the Scoping Document since the SWRCB members and the people of California are being asked to trade the potential effects of OTC on the marine environment for the impacts associated with closed-cycle cooling. These impacts will be much more visible than any potential effects of OTC and will impact a much larger percentage of the citizens of the state either directly through the impacts of the closed-cycle cooling structures, or less directly through increased costs for power.

5. For Track II, should the proposed policies require monitoring appropriate to determine actual percent reductions in mortality?

Yes, monitoring should be required for any technologies proposed for reducing the potential effects of IM&E. The EPA Phase II Rule lays out a comprehensive approach for compliance that should be incorporated into the State Policy. This approach is largely incorporated into the sections of the Comprehensive Demonstration Study (CDS) that are presented in §125.95(b) of the Phase II Rule. Specifically, the data collected as part of the IM&E Characterization Study would be used in combination with other data to establish baseline levels of IM&E, a Technology and Implementation Plan would be used to detail the measures used to meet the required levels of reduction, and a Verification Monitoring Plan would need to be submitted to verify that the technology achieves the required levels of reduction.

6. Should restoration projects be monitored to determine compliance?

Yes, but as stated above in the response to Question 3c, restoration will be difficult to implement as an interim measure and there are better, more flexible, and equitable approaches available that would still provide opportunities for implementing restoration projects to help address concerns regarding the potential effects of OTC. If a use-fee for

using ocean water for OTC could not be implemented, calculating restoration based on water usage may still be one approach for scaling restoration that would be more equitable across the state since the costs of restoration would vary so much among plants based on their locations and the cost of land. The funds from the use-fee or estimated restoration costs should go into a third-party fund with projects reviewed and approved by an Expert Panel. While this approach doesn't eliminate the need for monitoring it does remove that burden from the power plants since they would not be responsible for the selection, design, or implementation of the projects.

7. Should there be remediation if restoration does not comply?

Under the approach presented above, no remediation would be necessary since the power plants would not be responsible for the projects.