Public Comment
Once Through Cooling
Deadline: 5/20/08 by 12 p.m.

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DYNEGY

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Via Hand Delivery
Jeanine Townsend
Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814

Re: Comment Letter – Once-Through Cooling Policy

Dear Ms. Townsend:

Dynegy Inc. (Dynegy) submits these comments on the State Water Resources Control Board's (Board) "Scoping Document: Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling" (Mar. 2008) and Preliminary Draft Once-Through Cooling (OTC) Policy included in Appendix A thereto (Draft Policy). Dynegy has a substantial interest in this rulemaking as it owns and/or operates three coastal power plants in California -- Moss Landing, Morro Bay, and South Bay -- that utilize OTC in generating up to 3,885 MW to meet the State's electricity needs.

Dynegy has direct experience in California with many of the complex issues raised by the Scoping Document and Draft Policy as each of our three coastal power plants have recently proposed projects that thoroughly evaluated OTC and its alternatives. Moss Landing and Morro Bay have each proposed modernization projects using OTC that -- after detailed and comprehensive review -- were approved by the State. In addition, the South Bay Replacement Project proposed the use of dry cooling.[1] The single most important "lesson learned" from our experience in addressing these complicated issues is that determinations regarding cooling water technologies must be made on a case-by-case basis that thoroughly evaluates each site's unique circumstances. While we do not oppose the Board's goal of establishing a state-wide OTC policy to achieve consistency in section 316(b) determinations and intend to work with the Board to develop a workable policy, any such policy to be viable must recognize that each power plant and aquatic community is different and has unique issues that cannot be addressed by a "one-size-fits-all" standard. Accordingly, it is imperative that any state-wide OTC policy adopted by the Board explicitly allow for full consideration of all relevant site-specific factors.

[1] Dynegy has a fifty percent interest in a development joint venture with LS Power, the Applicant in the South Bay Replacement Project. The Project was withdrawn in October 2007.

Given Dynegy's recent experience in addressing cooling water intake technologies at its California costal power plants, our primary concern with the Draft Policy is that it fails to account adequately for the numerous and variable site-specific considerations that determine the feasibility of cooling water intake technologies at a particular site. For example, the Scoping Document ignores findings made through the rigorous California Energy Commission (CEC) permitting process at Moss Landing and Morro Bay regarding the infeasibility of closed-cycle cooling and the absence of significant adverse environmental impact from OTC at each of those facilities. The Scoping Document also fails to assess adequately the Draft Policy's far-reaching economic and environmental impacts. In proceeding with the development of a final OTC policy, it is critically important that the Board provide for consideration of all relevant site-specific considerations and perform a thorough analysis of the impacts of any such policy.

As explained in our comments below, in order to make implementation of an OTC policy workable, Dynegy recommends that the Board build in consideration of site-specific factors as an integral part of the policy as follows:

- Allow for cost-benefit analysis consistent with the United States Supreme Court's forthcoming decision that will define the permissible scope of cost-benefit analysis under Clean Water Act section 316(b)

- Use sound science to evaluate site-specific environmental harm of OTC and the environmental benefit of alternative technologies

- Assess and account for the site-specific adverse environmental impacts associated with closed-cycle cooling and other alternatives to OTC

- Meaningfully involve the CEC, CPUC and CaISO in implementation of any OTC policy with respect to the electrical grid reliability implications of each power plant's compliance options, as well as in the development of the OTC policy as it affects the State's ability to meet its increasing demand for electricity

- Give full credit to existing habitat restoration projects that already address a power plant's OTC environmental impacts

- Do not impose an inflexible and unachievable "one-size-fits-all standard" as set out in the Draft Policy; instead, define Track 2 in terms of an achievable level of reduction in impingement and entrainment mortality to be determined by site-specific evaluation

- In applying a Track 2 compliance standard:
  - Use a design flow baseline and, where demonstrated, allow site-specific credit for entrainment and impingement survival

- Determine compliance plant-wide and on an annual basis
- Where flow reduction is the compliance approach, do not require impingement and entrainment studies
- If compliance technologies installed to meet Track 2 ultimately fall short of the compliance standard due to circumstances beyond the discharger's control, do not require installation of additional controls

- Allow flexibility in any mandated final compliance dates to address site-specific realities where needed

- Do not give any single class of facilities a compliance exemption or extension, or alternative compliance options.

Our comments are presented in three sections. Section I addresses our overall concerns with the Scoping Document and Draft Policy. Section II provides comments on specific sections of the Draft Policy. Section III identifies shortcomings in the Alternative Cooling Water System Analysis study (with respect to our Moss Landing and Morro Bay plants) on which the Scoping Document relies.

I. General Comments

A. <u>Adoption of a State OTC Policy is Premature</u>

Dynegy strongly urges the Board not to take final action on any OTC policy until the United States Supreme Court determines whether cost-benefit analysis is permissible under Clean Water Act section 316(b). The lynchpin of the Draft Policy is the proposed state-wide determination that closed-cycle cooling is "best technology available" (BTA) under section 316(b). That determination rests squarely on *Riverkeeper, Inc. v. EPA*, 475 F.3d 83 (2d Cir. 2007) (*Riverkeeper II*), which held that cost-benefit analysis is not permitted in making BTA determinations. However, after the Scoping Document and Draft Policy were released, the United States Supreme Court granted certiorari in *Riverkeeper II*, agreeing to decide whether Clean Water Act section 316(b) "authorizes [US]EPA to compare costs with benefits in determining the 'best technology available for minimizing adverse environmental impact' at cooling water intake structures."[2] That issue will be briefed before the Court this summer, with oral argument expected in late 2008, and a final decision by no later than spring 2009.

In light of the United States Supreme Court's imminent decision on this critical issue, it is premature for the Board to determine BTA on the assumption that cost-benefit analysis is unlawful. Simply put, the stakes are too high for the Board to rush to judgment. Any OTC policy that addresses BTA will have far reaching implications for the State of California (*e.g.*, economics, environmental impact, grid stability, etc.); thus, it would be shortsighted to impose a policy before that key issue is resolved, particularly when the Supreme Court will decide that

[2] United States Supreme Court, Certiorari Granted, *Entergy Corp. v EPA*, *PSEG Fossil, LLC v. Riverkeeper, Inc.*, and *Utility Water Act Group v. Riverkeeper, Inc.*, Nos. 07-588, 07-589, 07-597 (Apr. 14, 2008).

issue within next 12 months. Reserving judgment for up to an additional year will not "seriously lengthen the period of time during which controls are not implemented", the stated rationale (Scoping Document at p. 39) for rejecting continuation of a permit-specific best professional judgment (BPJ) approach. While there may be rational reasons for not waiting until USEPA develops a new nation-wide 316(b) rule, it is imprudent to push ahead with a policy that precludes cost-benefit analysis on the assumption that such analysis is unlawful.

B. <u>A State-wide OTC Policy Must Be Based on Sound Science</u>

The Scoping Document (p. 12) acknowledges "[t]he biological impacts of OTC may not be adequately known since modern quantitative studies are difficult and costly." Yet despite acknowledging that the environmental impacts of OTC may not be adequately known, the proposed rulemaking approach would phase out the use of OTC, require expensive retrofits, or shut down electric generating units. Before proceeding with a rulemaking that would have such substantial impacts, the State needs to develop sound scientific studies that determine the adverse impact of OTC on the aquatic environment. The rush to judgment on an issue with such far reaching implications that is unsupported by sound science is unwarranted, ill advised, and arbitrary.

The Scoping Document -- in absence of any scientific evidence -- makes the sweeping conclusion that OTC causes, without exception, unacceptable aquatic/environmental impacts at all coastal power plant locations in California. The only support for that conclusion offered in the Scoping Document is absolute numbers from impingement and entrainment monitoring results, numbers which apparently are presented to create the impression that OTC is solely responsible for a significant decline of marine resources in California. In short, the Board staff's reasoning is that since large numbers of organisms are impinged and entrained by OTC, the adverse impacts from OTC to marine life in California must be large and, thus, a state-wide policy seeking to eliminate OTC is needed and justified regardless of any other considerations.

The fundamental flaw in this reasoning is that the impingement and entrainment monitoring results are meaningful only in a site-specific context. The Draft Policy seeks to eliminate the use of OTC to the exclusion of all other considerations, including whether closed-cycle cooling will result in any environmental benefit or whether a power plant's OTC system is causing adverse environmental impact to the affected water body. Indeed, the Scoping Document ignores the fact that industrial use (*e.g.*, cooling water) is a recognized beneficial use of State waters. *See* Cal. Water Code § 13050(f) (defining beneficial uses of waters of the state). It also fails to recognize the multitude of other factors impacting the health of California's coastal ecosystem, such as over-fishing, sediment erosion, non-point source pollution from urban and agricultural areas, sewage contamination, and exotic species invasion.[3] Moreover, the Board staff has failed to demonstrate that the significant economic,

[3] *See* EPRI, *Assessment of Once-Through Cooling System Impacts to California Coastal Fish and Fisheries,* at 4-1 (Dec. 2007). All documents cited in these comments are public records that the Board should include in the

environmental, and social costs imposed by its Draft Policy would appreciably benefit California's coastal and estuarine biological resources. EPRI, *supra* note 3, at vii (the empirical evidence "suggests that should use of OTC be eliminated immediately, no significant benefits to California's coastal fisheries may occur").[4]

The fundamental flaw in the Board staff's reasoning is demonstrated by the recent State determinations regarding the use of OTC at Moss Landing and Morro Bay. In both cases, after exacting review, the State determined that entrainment and impingement impacts from OTC were not so significant as to require closed-cycle cooling.

1. Moss Landing

The Moss Landing Power Plant has utilized OTC since it commenced operation in the 1950s. The plant is located on Moss Landing Harbor, off Monterey Bay and adjacent to the Elkhorn Slough. In 2001, two new gas-fired combined cycle units, Units 1 & 2, were brought on-line. These new units, in combination with existing Units 6 & 7, make Moss Landing the largest power plant in California in terms of electrical generating capacity, yet both generating blocks (Units 1 & 2 and Units 6 & 7) have among the lowest cooling water flow-to-MWh ratios of the California OTC power plants (see Scoping Document at 10).

In the NPDES permitting of new Units 1 & 2, the Central Coast Regional Water Quality Control Board (Central Board) required new entrainment studies to determine the impacts that could be expected from the operation of the new units. Those entrainment studies were performed under the direction of a technical working group that included Central Board staff and their independent technical experts, including scientists from Moss Landing Marine Labs and UC Santa Cruz. The studies found that 13 percent of the fish larvae in the Elkhorn Slough/Moss Landing Harbor are at risk of entrainment from operation of the new units.[5]

The Central Board staff and their independent scientists determined the OTC impacts at Moss Landing warranted mitigation, but were not so significant as to require installation of one of the other numerous alternative cooling or flow-reduction technologies that had been evaluated. In the 2003 *Staff Report*[6] for the Moss Landing NPDES permit, the Central Board staff explained that the impacts from OTC cannot be reliably translated into impacts to adult fish populations and, further, that eliminating OTC at Moss Landing is unlikely to result in discernable changes to the populations of fishes in Elkhorn Slough and Moss Landing Harbor.

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rulemaking record by administrative notice. A copy of any cited document will be provided to the Board upon request.

[4] The EPRI study, *supra* note 3, at p. 5-1, further concludes that, "The [Board] has not provided any quantitative technical information to support the nature of the fishery improvements that would be achieved by the [Draft Policy] despite the availability of a significant amount of recently collected and existing data documenting the magnitude of impingement and entrainment losses."

[5] The CEC also concluded that impingement impacts from Moss Landing Units 1 & 2 would not be significant. Commission Decision, Application for Certification Moss Landing Power Project, Docket No 99-AFC-4, Finding 12, at 188 (Nov. 2000).

[6] California Regional Water Quality Control Board Central Coast Region, *Staff Report,* Duke Energy Moss Landing Power Plant, Units 1 and 2, Review of Finding No. 48, NPDES Permit Order No. 00-041 (Apr. 10, 2003).

Specifically, the *Staff Report* quotes an independent study showing that the population of several species of fish in Elkhorn Slough has been stable or increasing over the past several decades while Moss Landing has been in operation:

> Since the 1970s, the abundance of both juvenile and adult fishes in Elkhorn Slough has decreased somewhat. However, in general, the species composition and overall densities of the dominant fish larvae appear to have remained fairly similar, with some species of fish larvae being considerably more abundant in 1999-2000 than in previous decades. The main categories of fish larvae exhibiting higher densities were gobies, the Pacific herring, Pacific sand lance, staghorn sculpin, white croaker, true smelts, and blennies.

Staff Report, supra note 6, at 13. The entrainment study for Moss Landing determined that six fish species made up 95 percent of all the fish subject to entrainment by the power plant: various gobies (87% of entrained larvae); Pacific staghom sculpin (2%); White croaker (2%); Blennies (2%); Pacific herring (1%); and Longjaw mudsucker (1%). In other words, *five of the six fish species most at risk for entrainment -- and representing 94 percent of all the fish species entrained by the power plant -- have actually increased in abundance over the past several decades* during which Moss Landing has operated using OTC. Although the study did find that the populations of two species of fish (*i.e.*, longjaw mudsucker and northern anchovy) appear to have declined over the past three decades, the study concluded that those changes appear to be habitat-related, and *not* due to Moss Landing's OTC system:

> Thus, the main reason for these changes in the Elkhorn Slough fish assemblages is erosion and the subsequent shifting of sediment, which has influenced the ability of certain fishes to feed and successfully spawn and produce larvae or for immigrating larvae to survive in waters that may be increasingly turbid and fast moving.

Staff Report, supra note 6, at 13. Moreover, after acknowledging the difficulty of linking population effects to impacts from Moss Landing, the *Staff Report* (at 14) concludes that:

> Even if one assumes that [Moss Landing] has contributed to the potential decline in longjaw mudsucker and northern anchovy larval species, the assumed benefit would then be an increase in these larval species if closed cooling were implemented. However, it is difficult to conceive a scenario in which potential increases in these two larval species could possibly justify the costs of closed cooling alternatives.

In short, the Central Board staff and their independent experts reviewed the site-specific data and concluded that, while the loss of larvae from the use of OTC at Moss Landing was by itself an impact, the impact was insufficient to warrant the use of alternative cooling or flow reduction technologies. The Central Board relied on that conclusion to require Moss Landing to fund $7 million in habitat restoration projects aimed at improving habitat quality and area for the species most at risk for entrainment. Importantly, those habitat restoration projects, which have been fully funded and are being implemented, address entrainment impacts from Moss Landing Units 1 & 2 over the entire duration of plant's operational life. Thus, any additional restrictions on OTC use at Units 1 and 2 are unnecessary and inappropriate, and the Draft Policy must expressly give full credit to plants that have already addressed OTC impacts.

2. Morro Bay

Morro Bay has utilized OTC since it began operations in the 1950s. In 2004, the CEC approved a modernization project at Morro Bay that would replace four units with two combined cycle units, finding that reuse of the existing OTC system in the modernization project would have no significant adverse environmental impact on aquatic biological resources.[7] Specifically, the CEC's Conclusions of Law included the following:

> 1. Modernization of the Morro Bay Power Plant with reduced use of once-through cooling and the Conditions of Certification proposed herein *will not cause any significant, direct, indirect or cumulative adverse impacts* within the meaning of CEQA.
>
> 2. There is no need to consider alternatives to once-through ocean cooling pursuant to CEQA because *such cooling will not have a significant, adverse environmental impact* pursuant to CEQA.
>
> 3. Entrainment of certain larvae in and of itself is a potential adverse impact requiring the use of the "best technology available" as defined by Clean Water Act section 316(b).
>
> 4. Modernization of the Morro Bay Power Plant with reduced use of once-through cooling and the Conditions of Certification proposed herein will comply with all applicable laws, ordinances, regulations and standards including, but not limited to, sections 316(a) and 316(b) of the Federal Clean Water Act.

Morro Bay Power Plant Project, 3rd Revised Presiding Member's Proposed Decision, 323 (June 2004) (emphasis added) (Morro Bay 3rd RPMPD).[8] While the CEC found that the modernized plant would have a potential adverse impact (*i.e.*, 16.2 percent mortality to larvae species affected by entrainment), the CEC determined that such an impact was "environmentally protective ... given the continued abundance of larvae in Morro Bay notwithstanding 50 years of plant operations." *Id.* at 321, Findings 30-31.[9] Moreover, the

[7] The CEC approved Morro Bay's Application for Certification on August 2, 2004 (Docket No. 00-AFC-12). The Decision has not yet been filed with the Docket Unit.

[8] The CEC Adoption Order dated Aug. 2, 2004, *supra* note 7, incorporates the Morro Bay 3rd RPMPD.

[9] The CEC noted that "massive mortality of the vulnerable larvae is normal, whether the power plant exists or not", Morro Bay 3rd RPMPD at 309, and concluded that "the record is clear that even without operation of the existing or proposed new power plant, the Morro Bay Estuary is on a path of rapid decline, largely due to

CEC expressly found that closed-cycle cooling at Morro Bay would cause greater overall environmental harm than continuing the use of OTC. *Id.* at 353, Finding 27.

In short, the Scoping Document's conclusions regarding harm from OTC are not supported by site-specific assessments at Moss Landing or Morro Bay. As a result, the Draft Policy is fatally overbroad because it is not supported by science at the site level. Nor has the Board staff supported its rationale for the Draft Policy with a sound scientific basis demonstrating state-wide adverse environmental impact from OTC. An approach that more fully considers site-specific empirical evidence is needed.

C. Adverse Environmental Impacts Associated With the Draft Policy <u>Must Be Fully Assessed</u>

The Scoping Document does not adequately evaluate the negative environmental impacts associated with alternative cooling technologies, most notably the decreased generation efficiency and commensurate increase in air pollutants, including particulate matter and greenhouse gases (GHGs). In particular, the Scoping Document fails to explain how the Board will balance the increase in GHGs resulting from its Draft Policy against requirements (AB 32 and Executive Order June 2005) that the State act to reduce GHGs. The agencies with expertise in these areas, such as the Air Resources Board, must be fully engaged in this process. A full analysis of the negative environmental impacts associated with alternative cooling technologies is needed on a program level.

The inadequacy of the Scoping Document's analysis at the program level is clear when evaluated in light of the CEC site-specific determinations for Moss Landing and Morro Bay. Specifically, the Scoping Document pays lip service to the adverse impacts of cooling towers -- the Board's preferred compliance method -- on air quality due to increased PM_{10} emissions, aesthetics, and agricultural resources. With respect to PM_{10} emissions, the Scoping Document does not adequately recognize the adverse air quality and health impacts associated with the increase in PM_{10} emissions from wet cooling towers. All of the California coastal OTC plants are located in designated nonattainment areas for PM_{10}.[10] Wet cooling towers will significantly increase PM_{10} emissions in those areas where PM_{10} air quality is already unhealthful. Moreover, the Scoping Document and Draft Policy fail to consider that the availability of PM_{10} emission reduction credits (ERCs) is a key issue for each of the OTC facilities because, none of the affected OTC power plants will be able to build or operate a wet cooling tower without sufficient local PM_{10} ERCs.

With respect to aesthetics, the Scoping Document (p. 51) dismisses the significant adverse visual aesthetic impacts of cooling towers by simply stating that "wet cooling towers could adversely affect aesthetics depending on local conditions and applicable laws, ordinances, regulations and standards." The adverse aesthetical impacts associated with cooling towers are,

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sedimentation." *Id.* at 4. Impingement impacts from the modernized plant were found to be not significant. *Id.* at 319, Finding 9.

[10] Tetra Tech, *California's Coastal Power Plants: Alternative Cooling System Analysis*, at p. 3-12 (Feb. 2008).

however, a critical factor underlying local opposition to cooling towers and will themselves often render a cooling tower infeasible. For example, at Morro Bay, the City of Morro Bay adopted several resolutions in opposition to dry and hybrid cooling system proposals based on their unsightly visual blight, and concluded that that closed-cycle cooling options "would adversely affect the City's beauty and uniqueness, would cause or exacerbate adverse effects on visual, noise, air quality, health, socioeconomics, hazardous materials, traffic and transportation, and other local natural resources compared to the proposed project." Morro Bay 3rd RPMPD at 337, 339-349. Indeed, the CEC found that cooling towers "would have substantial adverse visual impacts relative to the proposed facility and would eliminate one of the principal benefits of the modernization Project from the perspective of the City residents." *Id.* at 350, Finding 9.

Similarly, the Scoping Document does not adequately recognize salt drift from wet cooling towers as a potentially significant adverse environmental impact on agricultural resources. Instead, it summarily dismisses salt drift by stating only (p. 51) that "[a]gricultural land is not expected to be impacted by the construction of cooling towers at any of the existing [OTC] power plants (TetraTech 2008)." However, the cited Tetra Tech study acknowledges that "[s]alt deposition may affect particular crops under narrowly drawn conditions".[11] Salt drift is potentially a very important issue at Moss Landing, where fertile agricultural production is located on neighboring lands. In fact, the CEC rejected sea water cooling, in part, due to "saltwater drip impacts to agriculture". CEC Decision, *supra* note 5, at 159-160. While the adverse impact of salt drift from seawater cooling towers on agriculture may not be fully defined, the Draft Policy rashly excludes consideration of it as a potentially important adverse environmental impact.

D. <u>Electrical Grid Stability Must Be an Integral Part of Any OTC Policy</u>

In simple terms, the reliability of California's electric grid depends on the ability of the electrical generators to meet the State's increasing demand for electricity. By limiting the use or potentially causing the shutdown of any number of the 21 California OTC plants, the Draft Policy potentially would cause significant and serious negative impacts on the stability of the State's electrical grid, particularly with respect to peak demand periods and in localized service regions. Given the importance of maintaining electrical grid stability, it is imperative that the Board and its staff work in close collaboration with the CEC, California Public Utilities Commission (CPUC), and California Independent Systems Operator (CaISO) not only throughout the scoping process to determine what impact any state-wide OTC policy will have on grid stability, but also in the implementation process to ensure that gird reliability is, in fact, maintained.

We are very concerned that the Board has to date limited the input of the CEC, CPUC and CaISO in this process and would continue to limit their role in implementation of the Draft Policy. It is extremely unfortunate that Board staff did not meaningfully consult with these agencies before release of the Scoping Document and Draft Policy. Compounding that mistake,

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[11] Tetra Tech, *supra* note 10, at p. 4-11.

the role of those agencies would now be relegated to that of any other public stakeholder and, furthermore, the Draft Policy itself (§ 3.B.(2)) would limit the role of these key agencies to participating in an after-the-fact Statewide Task Force that will only advise on the discharger's proposed implementation schedule. Given the importance and complexity of grid stability, the Board and its staff needs to coordinate closely -- upfront in developing the Draft Policy, as well as throughout the implementation process -- with the CEC, CPUC and CaISO. The role of these agencies in the Statewide Task Force should not be limited only to advising on a plant's proposed implementation schedule; rather, the Draft Policy should expressly define the Statewide Task Force's role to include advising on the discharger's proposed implementation plan.

Notably, the OTC grid reliability study recently prepared for the Board (and Ocean Protection Council) states that:

> Perhaps the most relevant conclusion of this study, therefore, is that continued cooperation between the state's water agencies, energy agencies, utilities, power plant owners and non-governmental organizations is vital to maintaining electric system reliability standards while achieving water quality goals. Opportunities to continue this cooperation include the CAISO's current study of the effect of aging and OTC plant retirement, as well as its comprehensive transmission planning process, and the CEC's ongoing investigation of OTC issues.

ICF Jones & Stokes, *et al.*, *Electric Grid Reliability Impacts From Regulation of Once-Through Cooling in California*, 63 (Apr. 2008). In short, the CEC, CPUC and CaISO are not just interested stakeholders and, as recognized by the Board's own consultant, the OTC policy needs to be a coordinated effort amongst all these agencies to prevent unacceptable reliability impacts. This conclusion of the grid reliability study also strongly suggests that the Board should await the results of the CaISO's study and the CEC's investigation, which supports our concern that the OTC policy is premature.

Finally, the Scoping Document's discussion of impacts on "Utilities and Service Systems (including Grid Reliability)" (p. 74) fails to recognize that most of the affected OTC facilities are owned by independent power generators and, thus, unlike utilities, have no assured recovery of investment via ratebase treatment. For many of these older, low capacity factor plants, investment on the scale required to accommodate a retrofit with alternative cooling technology cannot be economically justified. Without a source of revenue to cover the appreciable level of investment in cooling system retrofit, many of these independent power generator plants will be retired. The Board's development of an OTC policy should account for this important consideration.

E. The Draft Policy Must Give Credit for Existing Habitat Restoration Projects

Any state-wide OTC policy adopted by the Board must give full credit for purposes of meeting the required compliance standards (*e.g.*, Track 1 or Track 2) to those power plants that have existing habitat restoration projects to address their OTC impacts. For example, at Moss Landing, the CEC approval and NPDES permit imposed mitigation and restoration programs that were designed to address the OTC impacts of the Units 1 & 2 throughout their operating life.[12] Specifically, the owner of the Moss Landing power plant was directed to pay $7 million to a dedicated fund to be used by the Elkhorn Slough Foundation for the acquisition and permanent preservation of lands that directly impinge on or contribute damaging impacts to Elkhorn Slough, habitat restoration activities, and long-term stewardship of the mitigation projects in perpetuity. Those programs have been successfully implemented: as of July 31, 2007, the Elkhorn Slough Foundation had acquired 2,000 acres and leveraged the initial $7 million to acquire real estate valued at over at $15.4 million, as well as engaged in phased restoration activities at six properties in the Elkhorn Highlands and a series of wetland properties.[13]

Because the OTC impacts of Moss Landing Units 1 & 2 have already been offset for the Units' entire operating life, Moss Landing Units 1 & 2 should be deemed to meet the compliance requirements/standard of any state-wide OTC policy and no further controls should be required. Although these Units (or any other similarly situated power plant) would still be required to meet any national 316(b) standards adopted by USEPA, they should not be subject to more stringent state requirements where the alleged impacts have already been addressed. To now require Moss Landing Units 1 & 2 to implement costly additional controls to address alleged harms that have already been addressed would be extremely unfair, harshly punitive, and entirely unjustified. Simply put, Moss Landing Units 1 & 2 should not be required to pay a second time because its OTC impacts have already been offset through a thoroughly vetted, State-approved, and implemented habitat restoration project.

In short, the Draft Policy must give full credit to existing habitat restoration projects for purposes of meeting an interim requirement (§ 2.C(3)), as well as meeting the main compliance alternatives (§ 2.A). The Draft Policy should expressly state that where a power plant is already implementing or has already implemented a habitat restoration project to address its OTC impacts, no further controls or compliance requirements are required and that the interim habitat restoration requirement does not apply.

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[12] Commission Decision, *supra* note 5, at 170-172, 194-200; NPDES Permit No. CA0006254, Findings 50 and 51. At Morro Bay, the CEC approval requires implementation of a habitat enhancement project, with the Regional Water Board to determine if the applicant's proposed funding of $12.5 million is sufficient. Morro Bay 3rd RPMPD at 381, Finding 23.

[13] Elkhorn Slough Foundation, *The Elkhorn Slough Environmental Enhancement and Mitigation Plan, Interim Report, Annual Update,* 3, 4 (July 2007).

F. **A State-wide OTC Policy Must Allow Site-Specific Solutions and Not Attempt to Impose a One-Size-Fits-All Solution**

Each power plant is unique in its design, location, and operation. Each aquatic environment is also unique and highly variable. Moreover, the interaction of a power plant's OTC system and its local environmental is site specific. As a result, any state-wide OTC policy must be designed to allow for site-specific considerations in all appropriate instances. The failure to do so will have numerous and significant adverse impacts, including greater overall harm to the local environment and potentially no benefit or even greater harm to the specific water body intended to be protected.

Instead of implementing a one-size-fits-all approach to OTC regulation as is set out in the Draft Policy, flexibility is needed to address each OTC-power plant's unique issues that dictate how or if it can best comply with new state regulations reducing the use of OTC. The Board's desire for state-wide consistency is not antithetical with the need to recognize site-specific factors. Rather, within the context of a state-wide OTC policy, the State -- the Board and other relevant agencies -- should work to create site-specific solutions.

As currently written, the Draft Policy fails to do that as it would essentially force each OTC plant to either retrofit with closed-cycle cooling (Track 1) or, where Track 1 is not feasible (using the Draft Policy's inappropriately narrow definition of feasible), achieve a comparable reduction in impingement and entrainment (*i.e.*, 90 percent) to that achieved by closed-cycle wet cooling (Track 2). That one-size-fits-all standard will not work. At Morro Bay, the CEC resoundly rejected closed-cycle cooling as infeasible, expressly finding that it would cause greater overall environmental harm than continuing the use of OTC. Morro Bay 3rd RPMPD at 353, Finding 27. The CEC went so far as to state that even if dry cooling were free, it would not recommend dry cooling at Morro Bay:

> In fact, based on the evidence in our record, we firmly believe that *even if dry cooling were feasible and cost free*, it would not offer the environmental benefits to the Morro Bay Estuary that a successful [Habitat Enhancement Plan] will provide.

Id. at 10 and 377 (emphasis added). Morro Bay is also subject to existing noise ordinances and zoning restrictions that prohibit the use of alternative cooling technology, and the City of Morro Bay adopted resolutions that opposed cooling towers due to their adverse impacts including visual blight and noise.

The Draft Policy does not clearly account for those considerations. Nor does it allow consideration of the fact that Morro Bay is located far from the load pocket and is in a far different commercial position than, for example, Moss Landing. Given its relatively undesirable location in ISO zone ZP26, and its low level of dispatch as a result of its comparative inefficiency, Morro Bay has been challenged to find a source of revenue sufficient to cover its operating costs. When the plant's contract expires at the end of 2011, it is far from certain that the market would support recovery of the significant incremental investment required to retrofit the plant with closed-cycle cooling, much less the ongoing operating costs of this 45-year old facility. Finally, the operation of Morro Bay is contingent upon a lease of the cooling water outfall property held by the City of Morro Bay. This lease expires at the end of November 2012, and prospects for its renewal are very uncertain. Yet, despite all of this, it is unclear whether Morro Bay would even qualify for Track 2 because the Draft Policy's definition of "feasible" does not allow for consideration of such factors. Moreover, the Draft Policy does not provide any deference, let alone controlling weight, to CEC determinations on the infeasibility of alternative cooling water technologies.

The Draft Policy also fails to recognize and include provisions that would take into account differences between generating units at a single facility. A single power plant may have multiple units that often are very different in physical and operation characteristics and have complex interrelationships that may significantly impact BTA decisions and feasibility determinations. What is appropriate or feasible for certain units may not be feasible for others at the same plant. For example, within Moss Landing, Units 6 & 7 are substantially different from Units 1 & 2 in both physical characteristics and economic viability. Because these two generating blocks are materially different, they should not be forced to implement the same compliance approach. To that end, the Draft Policy should be revised to clarify that compliance will be determined on a plant-wide basis with the discharger allowed to select the most appropriate compliance path for any units at the plant.

1. <u>Track 1 is Infeasible for Many Plants</u>

Reducing intake flow and velocity to a level equal to that which can be attained in a closed-cycle cooling system will not be not feasible at many of the OTC power plants. Indeed, State permitting authorities have recently rejected closed-cycle cooling at Moss Landing (Units 1 & 2) and Morro Bay as infeasible for numerous reasons. More specifically:

<u>Lack of PM_{10} Emission Reduction Credits (ERCs) Needed for Wet Cooling</u> -- At Moss Landing and Morro Bay, there are not enough PM_{10} ERCs in the respective air permitting jurisdictions to meet the air permit requirements needed to install and operate wet cooling systems.

At Moss Landing, analysis at the time of the NPDES permitting of Units 1 & 2 demonstrated that the quantity of PM_{10} ERCs required to cover the additional PM_{10} emissions associated with wet cooling for just Units 1 & 2 exceeded the total inventory of all PM_{10} ERCs in the Monterey County Air District.[14] That is still true today. Based on the Tetra Tech study (*supra* note 10, at Table J-9), wet cooling towers at Moss Landing would increase PM_{10} emissions by 381 tons per year. However, the current total inventory of PM_{10} ERCs in the Monterey Bay Unified Air Pollution Control District emissions registry is only 207.026 tons.

[14] Testimony of Duke Energy Moss Landing LLC, State of California, Regional Water Quality Board, Compliance with Remand of a Portion of NPDES Permit Re Cooling Water Intake of New Units 1&2, NPDES Permit No. CA0006254, at 58-60 (2003).

At Morro Bay, wet cooling towers -- assuming for the sake of argument that wet cooling was feasible, an assumption that directly contradicts the CEC's finding of infeasibility -- would increase PM_{10} emissions by 178 tons per year (Tetra Tech, *supra* note 10, at Table I-6),[15] but the total inventory of PM_{10} ERCs in the San Luis Obispo County Air Pollution Control District emissions bank is currently only 31.313 tons.

Even if Dynegy were successful in purchasing all currently available PM_{10} ERCs (which would require the sellers to forego whatever projects they themselves intended to pursue with their ERCs), there would be insufficient ERCs to support the wet cooling projects making them infeasible. Because each of the California OTC facilities identified in the Scoping Document is located in a designated nonattainment area for PM_{10} (Tetra Tech, *supra* note 10, at p. 3-12), the availability of PM_{10} ERCs is potentially a critical feasibility issue for each plant.

Local Ordinances Prohibiting Cooling Towers -- At Morro Bay, dry and hybrid (wet/dry) cooling were found to conflict with the City of Morro Bay's zoning policies and plans. Morro Bay 3rd RPMPD at 339. The CEC also expressly rejected wet cooling as infeasible at Morro Bay due to its "serious noise and visual impacts" and that it "could not meet local noise standards". *Id.* at 328. In addition, during the CEC permitting of the modernization project, the City actively opposed the use of any technology but OTC. Indeed, the City adopted several resolutions opposing dry and hybrid closed-cycle cooling systems and testified that it would not permit the plant to obtain the site control that was needed for construction of a dry or hybrid cooled plant. *Id.* at 339-348.

Site Restrictions -- The City of Morro Bay testified in the CEC proceeding that it would not permit the Morro Bay power plant to obtain the land access that was needed for construction of a dry or hybrid (wet & dry) cooling system. Morro Bay 3rd RPMPD at 337-338. Moreover, the CEC recognized that the necessary space may not be available on site to install dry cooling. *Id.* at 350, Finding 10. At Moss Landing, sufficient space may not exist to employ dry cooling for Units 6 & 7. EPRI, *Issues Analysis of Retrofitting Once-Through Cooled Plants with Closed-Cycle Cooling, California Coastal Plants*, App. B.10 (Oct. 2007) (for Moss Landing Units 6 & 7 "[t]here is no available space close enough … to install an air-cooled condenser with a reasonable steam duct length").

Salt Drift -- Salt drift from wet cooling towers would likely impose substantial maintenance burdens for all equipment around a power plant. This would be especially true at Moss Landing. Because Moss Landing is not within an enclosed building, the corrosive effects of this additional salt drift on the infrastructure would pose a material maintenance problem and expense and, in particular, cause potential arcing in the adjacent PG&E switchyard, which is a critical grid reliability infrastructure. Even with PM_{10} suppression technologies employed on the cooling towers, 466 tons of particulate -- primarily sea salt -- are anticipated to migrate off-site each year. This is over five times the amount of PM_{10} emissions currently produced by the

[15] Morro Bay 3rd RPMPD at 328 (recognizing that the Morro Bay area contains insufficient emission offset credits to compensate for saltwater drip particulate that would come from salt water cooling towers).

plant. In addition, Moss Landing is located in the midst of prime agricultural land. The accretion of this much salt on agricultural land raises serious concerns regarding potential detrimental impact on the fertility of this land and its agricultural production. *See* CEC Decision, *supra* note 5, at 159-160 (rejecting sea water cooling, in part, due to "saltwater drip impacts to agriculture"). At Morro Bay, the CEC rejected salt water wet cooling, in part, due to concern about salt drift from the cooling tower. Morro Bay 3rd RPMPD at 328.

<u>Lack of Recycled Water</u> -- The quantities of available recycled or freshwater at Moss Landing and Morro Bay are insufficient to cover each plant's respective need. Morro Bay 3rd RPMPD at 349, Finding 3 (concluding that freshwater is not reasonably available at the Morro Bay site for wet or wet/dry hybrid cooling); *Staff Report, supra* note 6, at 10 (freshwater cooling towers are unavailable for Moss Landing because very little freshwater is available in the area). Moreover, any effort to require recycled water, in whole or in part, would impose very significant increases in operating costs, and would introduce a dependency beyond the control of the plant that would potentially jeopardize its availability and reliability.

2. <u>Track 2 is Infeasible for Many Plants</u>

It is highly doubtful whether Track 2 is a viable option given that it requires a reduction in impingement and entrainment of 90 percent or greater. Absent use of a design flow baseline, which may allow certain low-use plants to restrict operations (*e.g.*, seasonal operation only) to meet the Track 2 compliance standard, it will likely be impossible for many plants to meet the 90 percent or greater standard using any available technology.[16] We do not believe that there is a single alternate technology available that could guarantee compliance with the Track 2 standard at any one of the California OTC power plants, let alone all or even several of those plants, as the performance of any individual technology (*e.g.*, aquatic filter barrier, fish returns, wedgewire screens, behavioral devices) can vary greatly depending on site-specific factors.[17] During the CEC siting process for both Moss Landing Units 1 & 2 and the replacement plant at Morro Bay, all known mitigation technologies were examined and rejected. At Moss Landing, the CEC rejected screens, nets, aquatic microfiltration barriers, and fish pumps because they were not expected to substantially reduce impingement or entrainment. CEC Decision, *supra* note 5, at 158. Further, the NPDES permit proceeding rejected wedgewire screens, fine-mesh screens, and aquatic microfiltration barriers as not being demonstrated technologies for reducing entrainment at the Moss Landing power plant and/or not demonstrated for the environment at Moss Landing. *Staff Report, supra* note 6, at 5-8. Similarly, at Morro Bay, the CEC rejected each of the alternative technologies as impractical, experimental, only having minor benefit regarding impingement, and/or not benefiting entrainment. CEC, *Staff Report, Morro Bay Power Plant Project, Final Staff Assessment - Part 3,* at 2-33 to 2-37 (Apr. 2002).

[16] *See* EPRI, *supra* note 3, at App. A (discussing the performance abilities of alternative fish protection technologies).

[17] As repeatedly explained in the Tetra Tech study, "the effectiveness of other technologies commonly used to address [impingement and entrainment] impacts could not be conclusively determined for use at [the specific facility]. As with many existing facilities, the site's location and configuration complicate the use of some technologies that might be used successfully elsewhere." Tetra Tech, *supra* note 10, at I-19; *e.g., id.* at J-35.

As a result, for the many power plants where Track 1 is infeasible, there is no known exclusion technology that would allow a facility to comply with the Track 2 requirement. The only possible compliance strategy for a plant in such a position would be to seek compliance through the adoption of operational restrictions, coupled with the application of technologies which, while insufficient in and of themselves to achieve compliance, would contribute to a reduction in the flow of cooling water through the plant. Through a combination of unit retirements, variable speed pump installation, modification of daily dispatch rates, screenhouse modifications, and prohibitions on dispatch during defined periods of time during the year, some facilities may be able to approach the Track 2 standard.

The key to a workable Track 2 standard requires re-examination of 90 percent as the appropriate reduction standard. The 90 percent standard is based upon levels of reduction associated with technologies which, for Track 2 power plants, are not feasible, and thus the standard is to a great degree arbitrary. Recognizing the Board's interest in material reductions in impingement and entrainment, Dynegy suggests that significant reductions are likely attainable but that the required reduction must be determined based on further site-specific evaluation. For a plant such as Morro Bay or at Moss Landing Units 6 & 7 (should closed-cycle cooling be infeasible), 90 percent is simply beyond what is understood to be technically achievable. Some OTC plants may be able to approach a 90 percent standard, but nevertheless would be forced to shutdown if they come up short. Thus, a 90 percent standard represents a compliance option that is really no option at all.

G. Track 2 Must Incorporate Various Site-Specific Factors to Make It <u>Workable</u>

1. <u>Design Flow Must be Used to Calculate Baseline</u>

The Draft Policy should expressly approve the use of design flow baseline in determining compliance with the BTA standards. Use of a design flow baseline has numerous advantages over performance-based baselines (*e.g.*, historic actual flow), is consistent with federal requirements[18] and OTC requirements in other states and, for those power plants where Track I is infeasible, will be essential to enabling a power plant to have any realistic chance of meeting the proposed Track 2 standard. A design flow baseline may also allow certain low use

[18] As USEPA explained in the preamble to the final Phase II Rule, 69 Fed. Reg. 41576, 41611 (Jul. 9, 2004), relying on design intake flow:

> provided clarity—the design intake flow does not change ..., whereas actual flows can vary significantly over sometimes short periods of time. EPA believes that an uncertain regulatory status is undesirable because it impedes both compliance by the permittee and regulatory oversight, as well as achievement of the overall environmental objectives. Further, using actual flow may result in the NPDES permit being more intrusive to facility operation than necessary since facility flow would be a permit condition and adjustments to flow would have to be permissible under such conditions and applicable NPDES procedures. It also would require additional monitoring to confirm a facility's status, which imposes additional costs and information collection burdens, and it would require additional compliance monitoring and inspection methods and evaluation criteria, focusing on operational aspects of a facility.

plants to operate only when needed and would preserve the ability of power plants to operate at their maximum flow when needed to meet California's electricity demands.

As explicitly recognized in the Scoping Document (p. 27), New York State determines compliance with OTC impingement and entrainment standards using a baseline when the facility is operating at full flow and full generating capacity (*i.e.*, the total volume of cooling water withdrawn when all pumps at the plant are continuously operating at full capacity every day of the year). We strongly urge the Board to adopt that approach in any OTC policy it adopts. The New York State Department of Environmental Conservation (DEC) has determined that full flow (*i.e.*, design flow) is the appropriate baseline to use for implementation of its own state BTA rule and policies, as well as for federal 316(b) purposes. Specifically, after a contested adjudicatory hearing in the NPDES permit for Dynegy's Danskammer Station, the DEC Deputy Commissioner concurred with the ALJ's finding that the full-flow baseline "should be used to determine the facility's compliance with entrainment and impingement performance standards" and that the DEC's rationale for selection of the full-flow baseline was "convincing and well-supported".[19]

As explained in the Danskammer adjudicatory hearing,[20] DEC's uses a full flow baseline because it ensures fairness among energy producers, it recognizes that every electric generating facility has the potential to operate at full-flow conditions given the deregulated nature of the electric generating industry, and it is consistent with federal requirements. Importantly, DEC also determined that a full-flow baseline was consistent with the intent to reduce adverse effects from cooling water intake structures because any reductions in flow, regardless of subjective motivation, reduce entrainment and impingement. Moreover, use of a full flow baseline would not unfairly punish facilities that have recently operated at lower pumping levels by not allowing them credit for flow reductions that have already been implemented. Aside from these sound policy reasons, DEC reasonably concluded that the full-flow baseline was an appropriate regulatory approach because of the inherent variability in operating capacity that electric generators face from year to year. In the absence of using a fixed, uniform baseline, DEC would be required to continually review and adjust the baseline contained in each facility's NPDES permit based on perpetually fluctuating seasonal and market variables. In light of this inherent variability and the attendant administrative difficulties, DEC concluded that such a shifting baseline would not be a fair or workable regulatory mechanism for the state-wide NPDES program.

In determining that the full-flow baseline was appropriate, DEC thoroughly considered, but rejected as poorly conceived and entirely unworkable, two alternatives: (i) a past performance (*i.e.*, actual flow) baseline, and (ii) a standard capacity factor baseline. DEC rejected a past performance baseline approach because it would: (1) be difficult to implement

[19] Danskammer Generating Station, New York State DEC No. 3-3346-0011/00002, SPDES No. NY-0006262 Decision of the Deputy Commissioner, 17 (May 24, 2006). DEC's decision is currently on appeal to the New York State Supreme Court Appellate Division, Third Department.

[20] Danskammer Generating Station, New York State DEC No. 3-3346-0011/00002, SPDES No. NY-0006262 Hearing Report, Daniel P. O'Connell, ALJ, 64-69 (Hearing Report) (attached to the May 24, 2006 Decision of the Deputy Commissioner, *supra* note 19).

in the deregulated electric industry; (2) result in a moving target as operations at electric generating facilities vary from year to year based on weather, fuel costs, and maintenance/repairs; (3) not be an accurate indicator of either future operations or future power demands; and (4) not be a balanced approach for all affected utilities. Likewise, DEC concluded that the standard capacity factor alternative would require the agency to establish a single capacity factor for all existing electric generating facilities and to decide how to distribute these reductions in cooling water flow during a particular period of time (*e.g.*, the flow limit could be imposed year-round, during biologically important times, etc.). DEC rejected the capacity factor approach because it would be difficult to base the capacity factor on objective criteria and because using a capacity factor would likely result in favoring some facilities over others.

The ALJ's Hearing Report, which was subsequently approved by the DEC Deputy Commissioner, discusses the baseline issue in detail before concluding that "calculating the baseline by using the full-flow capacity is a rational, conservative approach"[21] and, in contrast, "using past performance to calculate the baseline raises significant concerns about selecting the appropriate time frame … and would create a baseline that shifts from year to year."[22]

For all of these reasons, we strongly urge the Board to adopt a design flow baseline in any OTC policy it may adopt.

2. <u>Credit Must be Given for Entrainment and Impingement Survival</u>

Track 2 in the Draft Policy would require a comparable level (*i.e.*, 90% reduction or greater than would be achieved by wet cooling) for both "impingement mortality and entrainment of all life stages". Thus, credit apparently would be given for impinged fish that survive, but not allowed for entrained organisms that survive. The standard should be clearly expressed in terms of both "impingement mortality and entrainment mortality", and not merely "entrainment' as currently drafted. As succinctly explained by the *Staff Report* in the Moss Landing NPDES permit proceeding, "<u>[s]imply reducing rates in entrainment is not the objective. The objective is to reduce mortality.</u>" *Staff Report, supra* note 6, at 9 (emphasis in original).

In order to make Track 2 a viable compliance option for California OTC plants and consistent with the objective to reduce entrainment mortality, the Draft Policy should give credit on a site-specific basis for larva or eggs that pass through the plant's OTC system and survive. Site-specific scientific studies demonstrate that organisms survive entrainment, with some species showing significant entrainment survival rates. *See* Morro Bay 3rd RPMRD at 310 (testimony showing entrainment survival rates for larval fish and vertebrates exceeding a mean average of 50 percent and total survival rates of 88-98 percent for naked goby); Testimony of Duke Energy Moss Landing LLC, *supra* note 14, at 6, 9 n.13 (up to 80 percent of

[21] Hearing Report, *supra* note 20, at 68-69.
[22] *Id.* at 69.

certain species survive entrainment at Moss Landing).[23] At Dynegy's Danskammer Station, New York DEC allowed entrainment survival credit based on a site-specific scientific analysis. *See* Hearing Report, *supra* note 20, at 69-76 (concluding that DEC's allowance of an entrainment survival credit was justified because it was based on detailed site-specific studies conducted at the plant). Indeed, it would be unfair to penalize those power plants that have designed their OTC systems to enhance survival of entrained organisms (*e.g.*, reduced organism transit time through the cooling system, elimination of biocide) by not allowing credit for entrainment survival. In addition, a zero survival entrainment standard is inconsistent with the "impingement mortality" standard. In contrast, allowing credit for entrainment survival furthers the purpose of section 316(b) to reduce adverse environmental impacts.

Site-specific credit for entrainment survival is consistent with *Riverkeeper II,* which upheld USEPA's decision to not provide credit for "entrainment survival *on a national basis*". 475 F.3d at 126-127 (emphasis added). The Court did not outright reject entrainment survival credit and, in fact, USEPA's rule (and prior 316(b) guidance) had allowed recognition of entrainment survival for "well-constructed, sites-specific" studies. 69 Fed. Reg. at 41620. Allowing credit for entrainment survival is also consistent with the fact that the Draft Policy's standard is much more stringent than USEPA's now rescinded standard. *See id.* ("If EPA had incorporated entrainment survival into any of its conclusions regarding the appropriate [national] performance standards, then the actual performance standard would most likely have been higher."). In that respect, allowing credit for entrainment and impingement survival where demonstrated by site-specific studies potentially will be a very important factor in giving certain California OTC plants a realistic chance of meeting the Track 2 standard.

3. <u>Other Revisions Needed to Make Track 2 Viable</u>

To make Track 2 implementation viable, the Board should revise the Draft Policy as follows:

a) The Draft Policy should specify that the Track 2 percent reduction standard will be met by flow reductions measured on an annual basis. Any shorter-term flow reduction measure (*e.g.*, monthly basis) is unworkable and would potentially cause grid reliability issues by limiting electricity production during periods when the need for electricity is the greatest.

b) The Draft Policy should specify that compliance with the Track 2 percent reduction standard may be determined with respect to the entire power plant and is not required to determined on a unit-by-unit or intake-by-intake basis. For example, at Moss Landing, habitat restoration projects have already been implemented to offset the OTC environmental impacts of Units 1 & 2. Nevertheless, if it is feasible and makes economic sense to retrofit Moss Landing Units 1 & 2 with dry cooling (rather than pursue infeasible reductions from Units 6 & 7), the reduction realized from doing should be credited to Unit 6 & 7's

[23] *See also* EPRI, *Review of Entrainment Survival Studies: 1970-2000,* Technical Report No. 100757 (2000).

compliance with Track 2. Similarly, at Morro Bay, the permanent retirement of Units 1 & 2 (if ultimately pursued) should be credited toward the plant's compliance with Track 2.

c) The Draft Policy's definition of "feasible" should be expanded to account for all material site-specific factors as explained below (p. 25) in our specific comments on section 5 of the Draft Policy.

d) The Draft Policy should be revised to state that Track 2 monitoring is not required when compliance is based solely on flow reductions. A power plant that chooses to comply with Track 2 based solely on flow restrictions should not be required to perform initial baseline impingement or entrainment studies or, after Track 2 is implemented, to perform periodic impingement or entrainment sampling to confirm impingement and entrainment controls. Instead, the power plant should only be required to demonstrate the reduction in cooling water volumes. Assuming Track 2 in the Draft Policy is adopted, the Board has determined that a 90 percent reduction minimizes adverse environmental impact; thus, there is no need to conduct costly baseline impingement or entrainment studies as a 90 percent reduction in flow will minimize adverse environmental impact. Requiring impingement or entrainment studies in that case would be meaningless and only serve to impose significant additional costs.

e) Given the difficulties in and high cost of directly measuring cooling water volume flows, the Draft Policy should allow the use of appropriate calculations to demonstrate flow reduction where flow reduction is selected as a compliance strategy, rather than requiring direct measurement of cooling water volume.

f) The Draft Policy should clarify that compliance with any Track 2 percentage reduction standard may be determined in relation to a site-specific representative list of affected fish species, and is not required to be determined for all species.

g) The Draft Policy should be revised to state that if an approved Track 2 implementation plan is implemented but ultimately falls short of achieving compliance with the percent reduction standard through no fault of the discharger, then the discharger will not be required to implement additional controls. The efficacy of alternative cooling water technologies are highly variable and subject to a multitude of factors over which the discharger has no control. If the approved technology is appropriately installed, operated and maintained but does not reach the compliance standard, the discharger should not be punished by then having to install new controls.

H. Any Mandated Compliance Schedule Must Provide Sufficient Flexibility to Reflect Site-Specific Realities

The Draft Policy should be revised to recognize that each facility has unique considerations that may require a compliance timeline different from other similarly situated power plants (*i.e.*, as currently drafted, capacity utilization (i) 20 percent or less, or (ii) greater than 20 percent). For example, a plant such as Morro Bay, for which Track 1 is not a feasible solution, would likely be able to comply before the proposed January 1, 2015, compliance deadline as any necessary plant modifications may be of relatively modest scope. In pursuit of compliance at Morro Bay, technologies such as variable speed pumps and screenhouse modifications would be investigated and constructed, if justified. The construction and installation of such equipment would likely be feasible within the 5-year compliance window currently suggested for power plants with a capacity factor below 20 percent.

In contrast, the appreciable scope associated with Track 1 retrofitting of power plants (where Track 1 is a viable option) with a capacity utilization rate of 20 percent or less poses a number of challenges which suggest that a 2018 compliance deadline may be more appropriate. For example, at Moss Landing, the low historic capacity factor of Units 6 & 7 may cause the entire power plant (Units 1, 2, 6 & 7) to have a capacity factor of 20 percent or less, which would require the entire power plant to comply by 2015 under the Draft Policy. Consider that a retrofit of Units 6 & 7 (if found feasible) would require the relocation of existing power plant systems in order to provide the real estate, construction and integration next to operating units (Units 1 & 2) with numerous interferences, and possibly the simultaneous construction and integration of closed-cycle cooling on Units 1 & 2. The complexities and choreography required to execute such a plan suggest a different schedule than that required for power plants having a capacity 20 percent or less.

Other considerations, such as the CaISO's grid reliability concerns, also may dictate that the grid cannot afford to allow some facilities to be inoperable concurrently. If two such plants share the same compliance deadline, it is likely that they will pursue conversion at the same time.

To allow site-specific consideration of compliance scheduling issues does not require that the ultimate compliance schedule be undefined and left to the discretion of the regional boards. The compliance schedule could still be explicitly defined by the Board, but in a manner that better reflects the realities that must be accommodated at each facility.

I. The OTC Policy Should be Equally Applied to All Power Plants

If a state-wide OTC policy is to be adopted, the policy should be equally applied to all OTC facilities. Certain classes of facilities should not be exempt from regulation or automatically given extended compliance deadlines that are not allowed for all facilities. The Board's concerns regarding environmental impact of OTC are the same regardless of the type of facility using OTC. Thus, it is inappropriate to grant whole-scale exemptions, extended compliance deadlines or other alternative compliance options to one class of facility. All facilities should have equal opportunities for case-specific extensions or alternative compliance options. Safety considerations, where warranted, should be considered on a case-by-case basis without regard to the type of facility.

II. Comments on Specific Sections of the Draft Policy

Section 1 - Introduction

Paragraph D, which addresses California Water Code section 13142.5, should be deleted. Section 13142.5 applies *only* to new and expanded coastal power plants. It is irrelevant to the Draft Policy, which addresses only existing power plants. As such, the Board cannot rely on section 13142.5 for legal authority to adopt this policy. Nor does it support the Board's objectives in pursuing the Draft Policy for existing plants.

Paragraph G states that the intent of the policy is to ensure that beneficial uses of the State's waters are protected. Industrial use (*e.g.*, cooling water) is one such recognized beneficial use, yet the Draft Policy fails to explain how such use is protected by the policy. The Board should rewrite this paragraph to reconcile this conflict and expressly recognize that industrial use is a beneficial use.

Paragraph H inappropriately limits the Statewide Task Force's role to review of implementation plans and schedules submitted by dischargers. Given the far reaching implications of any OTC policy adopted by the State, the complexity of the issues involved in ensuring that electric power needs of the State are met, and the Board's lack of expertise in ensuring reliability of the electrical grid, the Statewide Task Force should be directly involved in the development of the policy and not be limited to a role in after-the-fact implementation.

Section 2 – Requirements for Existing Power Plants

A. Compliance Alternatives

As a prerequisite to using the Track 2 compliance option, a power plant must demonstrate to the Board's satisfaction that Track 1 is "not feasible." Given the importance of this prerequisite "demonstration", the Board should explain in greater detail what the required demonstration would entail. In that regard, the Draft Policy should explicitly accept as definitive (or at least give deference to) a prior CEC site-specific determination that closed-cycle cooling is not feasible. Any such CEC determination is made on a site-specific basis after a detailed and comprehensive review process that was open to public participation. The Board should not now second-guess those determinations or require a discharger to demonstrate infeasibility a second time. To do so would unnecessarily impose substantial costs and needlessly delay the implementation process.

B. Final Compliance Dates

The Scoping Document (pp. 8-11) recognizes that the cooling water required per MWh generated is highly variable among the 21 coastal power plants in California. To the extent scheduling implementation of BTA requirements under any state-wide policy requires prioritization, the Draft Policy should, subject to grid reliability concerns, establish a presumption that plants using more cooling water per MWh generated (*i.e.*, plants with a higher MG:MWh ratio) should be required to comply before those plants that use less cooling water per MWh generated. Such a presumption would focus compliance on those plants with, all things being equal, the potentially largest impact.

C. Interim Requirements

1. Reduce Flows to 10 Percent When Not Operating for 2 or More Consecutive Days

The Draft Policy should allow for site-specific exceptions to the 10 percent limit for good cause. Circulating water pumps run when electricity is not being generated for numerous and diverse reasons, including maintenance/cleaning, required flow testing, and, at certain facilities, even to accommodate State emergency crew "swift water rescue" training activities. While a 10 percent limit generally should be sufficient to cover such flows, the Draft Policy should authorize case-specific exceptions where warranted.

2. Habitat Restoration

The Draft Policy's requirement for interim habitat restoration should be revised as follows:

a) Full credit must be given for existing habitat restoration projects. (See *infra* section I.E of these comments.)

b) Habitat restoration projects as an interim requirement should correlate with the plant's OTC impacts for only that interim period of time before the plant complies with Track 1 or Track 2. That is, any interim habitat restoration project must be limited in scope to offset OTC impacts during the short-term interim period, and not cover impacts over the remaining life of the plant. The Draft Policy should be revised to state that more clearly.

c) The Draft Policy should clarify that interim restoration may be satisfied solely by funding (either a one-time payment or annual payments by the discharger) and that the restoration projects may be implemented entirely by an outside party. For example, the Moss Landing owner satisfied its environmental enhancement program requirement by a one-time payment of $7 million to a dedicated account for use by the Elkhorn Slough Foundation. The Moss Landing owner was not itself required to engage directly in performing restoration activities. Nor should power plants owners/operators be required to do so under an OTC policy because restoration is very likely not within the discharger's expertise or experience.

d) The Draft Policy should clarify that funding of interim habitat restoration requirements may be based on projected or actual annual flows during the interim period. Because interim restoration is short-term temporary measure, detailed, complex biological models should not be required. In addition, up-front, one-time payments should not be required, given that the retirement date of certain power plants may not be certain.

e) The Draft Policy should clarify that once the approved habitat restoration project has been fully funded, the discharger's obligation is deemed fulfilled. Follow-up studies should not be required and, because it is only an interim measure, the discharger should not be held responsible if the efficacy of the restoration project ultimately falls short of what was anticipated.

<u>Section 3 - Implementation</u>

The Board must clarify how the implementation process would work. In general, more information is needed on how the Statewide Task Force advisory process would work, including issues such as what the advisory process would be (*e.g.*, open, public meetings at which the Task Force reviews the proposed plan/implementation schedule, or will the Task Force only submit written comments to the Water Boards?); on what grounds the Water Boards could reject or unilaterally modify the advice of the Task Force; and how the discharger could participate in and, if needed, contest decisions by the Task Force.

The Board also should provide a more detailed explanation of how a discharger's implementation plan will be implemented through the plant's NPDES permit. As part of that explanation, the Board must explain what happens if delays in permitting or implementation occur due to circumstances beyond the discharger's control. In accordance with basic notions of fairness, a discharger should not be held responsible for failure to meet implementation deadlines for reasons beyond its control.

Finally, section 3.B(2) of the Draft Policy should be corrected. Paragraph H of the Draft Policy's Introduction states that the Statewide Task Force "will assist the Water Boards in reviewing implementation plans and schedules submitted by dischargers pursuant to this policy." Contrary to that statement, the second sentence of section 3.B(2) would limit the role of the Statewide Task Force to advising only "on the discharger's proposed implementation schedule". Given the importance and complexity of grid reliability issues and consistent with Paragraph H of the Introduction, section 3.B(2) should be revised to expressly state that the Statewide Task Force will advise on both "the discharger's proposed implementation plan and proposed implementation schedule".

<u>Section 5 - Definition of Terms</u>

The proposed definition of "Feasible" is too restrictive because it would preclude full consideration of all material factors potentially affecting feasibility at a specific power plant. It should be revised in several important respects, as follows:

a) The definition should expressly reference other important site-specific factors affecting feasibility determinations, such as "availability of PM_{10} emission reduction credits, salt drift, and visual aesthetics".

b) The list of factors to be considered should not be exclusive, but rather explicitly include "any other appropriate factors". The reference to "any other appropriate factors" is needed to ensure that all meritorious site-specific factors may be considered.

c) Noise impacts should not be limited to "neighboring commercial and recreational land uses" as currently drafted, but should also cover impacts on "residential" land uses.

d) The factor concerning "the ability to obtain necessary permits" should be expanded to include necessary "or approvals" (*i.e.*, it should not be limited only to "permits").

III. Comments on the Alternative Cooling System Analysis Study

The Scoping Document relies on the Alternative Cooling System Analysis study prepared by Tetra Tech (Feb. 2008). That study ignores many important considerations when determining whether alternative cooling is feasible at any particular power plant, including (as described in our comments above) the physical layout of the facility, availability of ERCs to address increases in emissions such as PM_{10}, local zoning laws, ordinances/resolutions on noise and visual impact, and the adverse environmental impacts of closed-cycle cooling technology. The study's analysis of Moss Landing and Morro Bay also has several important errors or omissions.

A. <u>Moss Landing</u>

The study's economic analysis regarding Moss Landing is flawed in several significant respects. First, the study fails to recognize the impact increased PM_{10} air emissions would have on retrofitting Moss Landing with sea water cooling towers. The study estimates that cooling towers would increase PM_{10} emissions by an additional 381 tons per year. Based on the Air Resources Board's currently available annual Emission Reduction Offsets Transaction Cost Summary Reports, the last recorded sale (in 2002) of PM_{10} credits in the Monterey County Air District was at \$19,690/ton. Even if sufficient credits existed for purchase at this price, the incremental capital cost would be between \$1.2 MM and \$18.4 MM, depending on the offset ratio applied to each credit, which is a function of the location of its ERC source. Using the methodology employed in the study, this equates to an annual carrying cost of \$1.1 MM/yr to \$1.8MM/yr. Given the quantity of PM_{10} credits required, it is unlikely that the price would remain at \$19,690/ton. In a market with limited PM_{10} credits, the price is likely to climb as Dynegy buys whatever is available, substantially increasing the cost of the retrofit.

Second, given the 40+ year age of Units 6 & 7, a 20-year remaining life is unlikely. A 10-year or 15-year remaining life is likely more realistic. Third, the study significantly understates the heat rates of Units 6 & 7: instead of 9,100 Btu/kWh, the heat rate is 9,400 Btu/kWh or higher. Though the absolute value of these heat rates is somewhat immaterial to the calculation of incremental cost, it is important when considering the ability of these units to generate margins sufficient enough to shoulder the incremental costs of a retrofit. Fourth, Moss Landing is not located in SP15. It is located in NP15, a region with generally lower prices than SP15. A comparison of 2006 realized revenues vs. the revenues estimated in the study implies that NP15 revenues were 22 percent lower than SP15.

The study's cost-to-revenue comparison is also a highly misleading metric to gauge economic impact because revenues associated with thermal plants are enormous due to the enormous fuel costs associated with production. A far more meaningful measure would be to compare such costs against the gross margin of the plant, which reflects how much money is left over after paying for the fuel used to generate MWhs. Such a comparison reveals that the incremental costs computed in the study (which are incomplete given the omission of PM_{10} costs) would have consumed 18 percent of the gross margin of Units 1 & 2 in 2006. This is an enormous financial consequence, reducing by nearly one-fifth the amount of money left over to pay all other operating costs. For Units 6 & 7, the incremental cost of the retrofit would likely exceed all of the gross margin available from the energy market, making it impossible to keep those units economically viable without some sort of capacity or reliability contract.

Finally, it should be noted that the increase in variable cost of production associated with a retrofit will result in the plant being dispatched less frequently, thereby reducing the MWhs produced by the facility and exacerbating the impact on profitability.

B. Morro Bay

The study's analysis of Morro Bay also contains several significant errors in its analysis. Most importantly, the study fails to recognize that the Morro Bay modernization project underwent an extensive environmental review of the alternative cooling technologies during the CEC siting process and, as a result of that review, the CEC expressly rejected closed-cycle cooling as infeasible at Morro Bay. The CEC determined that the reuse of the existing OTC system at Morro Bay avoided any potentially significant impacts on the marine environment, concluding that it would "not cause any significant, direct, indirect or cumulative adverse impacts" and that "there is no need to consider alternatives to once-through ocean cooling pursuant to CEQA because such cooling will not have a significant, adverse environmental impact pursuant to CEQA." Morro Bay 3rd RPMPD at 323. Moreover, in rejecting dry cooling as infeasible, the CEC went so far as to state "that *even if dry cooling were feasible and cost free*, it would not offer the environmental benefits to the Morro Bay Estuary that a successful

[Habitat Enhancement Plan] will provide." *Id.* at 10 and 377 (emphasis added). The CEC review process was far more exacting and comprehensive than the Tetra Tech study and, consequently, the CEC's extensively developed record and findings regarding the infeasibility of alternative cooling technologies at Morro Bay should be considered definitive.

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Overall, as the State moves forward in developing and adopting a state-wide OTC policy, Dynegy believes the Board should await the United States Supreme Court's decision on whether cost-benefit BTA determinations are permissible, develop a sound scientific basis for such a policy in terms of the harm from OTC and the harm and benefits of any new requirements, and ensure that any such policy allows for full consideration of all site-specific factors affecting OTC issues. We look forward to working with the Board to develop a workable OTC policy that reasonably balances the many different, complicated and important considerations involved.

Thank you for considering Dynegy's comments on the Scoping Document and Draft Policy. If you have any questions concerning our comments, please contact Barb Irwin, Director Environmental Western Fleet Operations, at 925-829-1804.

Sincerely,

Daniel P. Thompson
Vice President
Dynegy Western Fleet Operations

cc: Office of the Governor
California Energy Commission
California Public Utilities Commission
California Independent Systems Operator