(5/5/15) Board Meeting
Desalination Amendments
Deadline: 4/9/15 by 12:00 noon

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4-9-15
SWRCB Clerk

April 9, 2015

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

RE: Comments on the State Water Resources Control Board proposed Amendments to the Water Quality Control Plan for Ocean Waters of California (the "California Ocean Plan") Addressing Desalination Facility Intakes and Brine Discharges

Dear Ms. Townsend:

This letter provides Coastal Commission staff comments on the above-referenced proposed desalination-related amendments to the California Ocean Plan. These amendments have been many years in the making, and we greatly appreciate the efforts of the State Board staff to pull together the many stakeholder interests and provide for constructive involvement with Coastal Commission staff and staff from other agencies in developing the proposed amendment.

Interest in seawater desalination has increased recently with the current statewide drought, and although desalination is generally not considered as providing an immediate response to the current drought, it may play a more significant role in the state's long-term water supply portfolio. The proposed desalination amendment therefore has an important role to play in both helping to establish an appropriate role for desalination in coastal water supplies and to ensure that it is done in an environmentally sustainable manner that protects the full range of coastal resources important to California.

The proposed amendments (hereafter referred to as the "desalination policy" or "policy") are based primarily on the requirements of Porter-Cologne Act Section 13142.5(b), which states:

> *For each new or expanded coastal powerplant or other industrial installation using seawater for cooling, heating, or industrial processing, the best available site, design, technology, and mitigation measures feasible shall be used to minimize the intake and mortality of all forms of marine life.*

We are largely in support of the proposed amendments, though we do have several concerns and recommended changes, as detailed below. Our comments are primarily meant to allow the proposed amendments to be consistent with, and to complement, other relevant policies and requirements, particular the California Coastal Act and its accompanying regulations.

AREAS OF SUPPORT

We generally support the following components of the proposed policy as being largely consistent with Coastal Act requirements and the Coastal Commission's practice in reviewing desalination projects. Our areas of support include the following:

Regarding intakes –

- ***Preference for subsurface intakes:*** We concur with the policy's conclusion that subsurface intakes are the preferred alternative and that surface intakes are to be permitted only where subsurface intakes are determined to be infeasible. This approach is consistent with the requirement of Porter-Cologne Act Section 13142.5(b) to use all feasible means to minimize the intake and mortality of marine life and is also consistent with the approach the Coastal Commission has taken to implement Coastal Act Section 30231, which requires that the adverse effects of entrainment be minimized to the extent feasible. As noted below, however, we have concerns about how the policy addresses certain components of determining feasibility.
- ***Requirement for screens on open intakes:*** We concur with the policy's requirement to screen surface intakes. From the data presented in the Staff Environmental Document ("SED"), we recognize that screens are not likely to reduce the overall entrainment rate as much as initial studies suggested; however, they continue to have a necessary role in helping to "minimize the intake and mortality of marine life."

Regarding mitigation –

- ***Full mitigation:*** We concur with the policy generally requiring full mitigation for all marine life mortality resulting from desalination facility construction and operation. We also recognize that, in some cases, construction-related effects are temporary and the affected habitat is restored naturally.
- ***Using the Empirical Transport Model (ETM) and Area of Production Foregone (APF) to determine the type and extent of a facility's adverse effects on marine life:*** We concur with the use of ETM and APF to identify marine life impacts and to determine the type and extent of necessary mitigation.
- ***Using a 95% certainty level:*** We concur with the policy's use of the 95% certainty level to establish the amount of mitigation needed. This is particularly important given that the policy would require mitigation only at a 1:1 ratio or lower (i.e., to as low as 1 acre of mitigation for every 10 acres of APF). The 95% certainty level will provide the necessary high degree of confidence that the required mitigation will adequately compensate for the expected losses.
- ***Acceptable methods of mitigation:*** We concur with the policy allowing two main options for compensatory mitigation – either creation, restoration, or expansion projects in certain types of habitat that include appropriate performance standards, monitoring requirements, financial assurance measures, and other standard mitigation components, or full payment to an approved agency to implement these same types of mitigation projects. However, we have a strong preference for the first approach and several concerns about the latter. As we noted in our previous comments from August 2014, there is currently no mechanism available to ensure that the payment option provides the accountability needed to ensure that a permit condition requiring a particular mitigation outcome is actually implemented, or that any

shortcomings in the implementation can be corrected. For example, if a facility operator pays a fee to a public agency to implement a project that is not completed or is unsuccessful, it is not clear who would hold the responsibility to complete the project successfully. We also understand there are currently no agencies able to implement this second mitigation option, and therefore expect these concerns to be addressed through interagency collaboration before this mitigation option is available. We would be happy to work with the Board, other agencies, and stakeholders to develop the appropriate mechanisms to allow this mitigation option.

Regarding discharges –

- ***Requiring a protective discharge salinity limit:*** We concur with the policy's proposed discharge limit of no more than a two parts per thousand salinity increase compared to natural background levels. The data and studies cited in the SED suggest this limit would be adequately protective of marine species.
- ***Requiring a limited Zone of Initial Dilution (ZID):*** We concur with the ZID being limited to no more than 100 meters from the point of discharge. This appears to be both reasonable and achievable, particularly when combined with the preferred methods of a facility discharging with a combined wastewater discharge or using diffusers.

AREAS OF CONCERN AND RECOMMENDED CHANGES

We have concerns and recommendations regarding the following aspects of the proposed policy, each of which is described in more detail below:

1) The policy should include required interagency coordination and a required or recommended order for permit review.
2) It should not allow the use of flow augmentation from surface intakes.
3) It should not yet allow mitigation through Marine Protected Area modifications.
4) It should acknowledge and provide guidance on the Regional Boards' limited ability to use the policy in determining the economic feasibility of a proposed project.
5) The policy's "needs" test should be based on a more detailed description of expected reliance on a proposed desalination facility.

1) The policy should include required interagency coordination and a required or recommended order for permit review.

We appreciate that the policy includes several references to the need for coordination and consultation among the Regional Boards and involved agencies; however, as currently proposed, it does not ensure that the necessary level of coordination will occur or that permit review will be done in an efficient and comprehensive manner. State agencies and stakeholders have long recommended implementation of a coordinated permit review process,[1] and including a coordination requirement in the policy is particularly important given the shared jurisdiction of the Regional Boards, Coastal Commission, State Lands Commission, local jurisdictions, and others over particular aspects of seawater desalination. For example, the Coastal Commission's

[1] For example, the October 2003 *Findings and Recommendations* of the State Desal Task Force included Recommendation #17: "To improve communication, cooperation, and consistency in permitting processes, encourage review processes for each desalination project to be coordinated among regulators and the public."

review determines a project's consistency with Coastal Act policies on marine life protection, placing fill in coastal waters, and others. It also often includes determining a project's conformity with a Local Coastal Program, which usually establishes requirements related to land use, zoning, or similar provisions that are not considered in the review conducted by the Regional Boards or State Lands Commission.

We recommend the policy include additional guidance regarding the type and level of coordination required and that it include a recommended order of review and permitting. Although the standard review process will vary to some degree by a facility's design or location, the following order generally lays out a review path that results in an applicant addressing each of the involved agencies' requirements in a coordinated and comprehensive manner:

1) Conduct required environmental review (CEQA and/or NEPA).
2) Obtain local permits and landowner approvals.
3) Obtain Coastal Commission approval.
4) Obtain Waste Discharge Permit/NPDES Permit from Regional Boards.

We understand from Board staff that the necessary level of coordination might be addressed instead through development of a Memorandum of Agreement among the involved agencies. While we support development of such an agreement, we also recommend the policy more strongly address the need for interagency coordination. We recommend the policy acknowledge the role of the state's Seawater Desalination State Interagency Working Group (IAWG), which includes representation from involved state agencies and provides an appropriate forum for the required or recommended coordination.[2] Requiring or recommending that coordination occur through this group would provide a mechanism in the policy that allows for efficient and comprehensive coordination.

2) The policy should not allow the use of flow augmentation from surface intakes.
We recommend the policy not allow for flow augmentation from surface intakes. We have four main areas of concern about this aspect of the proposed policy, as described below:

a) Inconsistency with Water Code Section 13142.5(b). Section 13142.5(b) requires facilities to use the best feasible measures available to "minimize the intake and mortality" of marine life. However, flow augmentation, by definition, results in an increase in the intake and mortality of marine life. Because entrainment levels are directly correlated to intake volumes, the higher the intake volume of a given intake, the higher its entrainment levels. Drawing in additional water solely for flow augmentation represents an increase in intake and mortality that goes against the language of this Water Code section.

This would be the case even if flow augmentation resulted in something less than 100% mortality. As an example, if source water contained one organism per gallon, a facility pulling in 50 mgd for processing would entrain 50 million organisms per day. If that facility pulled in an additional 20 mgd for flow augmentation and that additional flow resulted in only 50% mortality, the facility would still increase its entrainment by 10 million organisms

[2] See description at: http://www.opc.ca.gov/desal/

per day. Only in the highly unlikely event that flow augmentation could be accomplished with zero percent mortality would this not be the case. Accordingly, allowing flow augmentation from an open intake is not consistent with a provision of the Water Code that requires minimization of intake and mortality.

b) ***The policy's proposed basis for allowing flow augmentation is entirely speculative.*** The amendment would allow a facility operator to submit data and studies to show that flow augmentation is as protective of marine life as combining a discharge with wastewater or discharging through diffusers. This contention – that flow augmentation can result in less than 100% mortality – has been around for more than a decade. However, and as stated in the SED and the Response to Comments, there are no data to support this contention and no accepted studies showing this to be the case.[3] The few available data and studies conducted thus far primarily apply to laboratory settings or to inland riverine or lake settings, not the marine environment.

This lack of studies and conclusive data appears to be due largely to the difficulty of conducting such a study in the marine environment. A definitive study would have to include identifying and counting organisms as they enter an intake, as they pass through an intake system (where they may be subject to predation within the conveyance pipes), as they are subjected to high salinity levels where the augmentation flows combine with a facility discharge, and as they are discharged out the end of an outfall and beyond to determine comparative survivorship in the receiving waters. Not only would it be difficult to implement such a study, it would also be difficult for the study to determine what particular components of the intake/discharge system were responsible for mortality and which of those components should be modified to improve survivorship.

Further, and as noted in the SED and Response to Comments, not only are there no accepted studies, there are no technologies that have been proven to reduce the mortality of organisms entrained in a seawater intake. While some methods have been proposed – e.g., low velocity pumps, low turbulence intake pipes, etc. – the studies and tests needed to determine whether those methods might reduce intake mortality in California's marine environment have not yet started and may take many years to provide conclusive results. We therefore recommend the policy not allow for flow augmentation from surface intakes unless and until there are studies proposed and implemented that can provide the necessary levels of certainty and until there are proven methods that might be applied to provide a particular level of survivorship. Once those occur, the policy can be amended as needed.

c) ***The policy proposes an inappropriate standard to measure the effectiveness of flow augmentation.*** The policy would require a Regional Board to consider whether a study shows that flow augmentation is "less protective" of marine life, compared to wastewater dilution or multiport diffusers. Pursuant to Section 13142.5(b), the correct standard should be whether flow augmentation "minimizes the intake and mortality" of marine life as compared to those other methods. While "less protective" may be a suitable standard to

[3] See, for example, Response to Comment 9.4.

compare wastewater dilution with diffusers, it is not an appropriate standard to apply to flow augmentation. The two other methods are solely discharge-related, whereas flow augmentation and its effects are primarily intake-related and result from an intake's site, design, and technologies, which are the subject of Section 13142.5(b) and its requirement to minimize the intake and mortality of marine life.

d) ***The policy's mechanism to allow flow augmentation from surface intakes would create inconsistencies among regulatory requirements.*** The policy would allow a facility operator to use flow augmentation for up to three years while developing and implementing a study to characterize the resulting intake and mortality. At the end of that period, the Regional Board would determine the resulting level of mortality and determine what facility changes or compensatory mitigation measures might be required.

This approach would create at least two inconsistencies with applicable requirements of CEQA and the Coastal Act. Pursuant to CEQA requirements, the mitigation needed to address a recognized impact must be identified during environmental and permit review, not put off until later. A lead or responsible agency cannot issue a permit with a requirement that the permittee come back later for consideration of what mitigation measures or compensatory mitigation may be needed. The proposed desalination policy would allow just that – issuance of a permit with up to three years of operation before making a determination of the impacts of the operations or what mitigation might be required. Additionally, it is unclear from the proposed policy how long a permittee would have to implement the necessary mitigation, so actual mitigation might not start until long after the adverse effects that require mitigating have already impacted the environment.

This component of the proposed policy is also inconsistent with coastal development permitting requirements, as the Coastal Commission cannot approve a permit with unknown adverse environmental impacts or where the determination of required mitigation is deferred until after approval of the permit, much less for several years after adverse impacts have occurred.

Finally, in regard to flow augmentation, you may know that the Coastal Commission and Poseidon Water have convened an independent expert panel to characterize the feasibility of different subsurface intake alternatives for Poseidon's proposed facility in Huntington Beach. As part of that review, we have asked the panel to evaluate alternative intakes both with and without Poseidon's proposed flow augmentation – e.g., at Poseidon's proposed 127 mgd intake volume, which includes about 27 mgd for flow augmentation as well as a 100 mgd volume that does not include flow augmentation. This review may result in substantial improvement of the project's ability to minimize the intake and mortality of marine life and may also result in significant cost reductions.

Based on the above, we therefore recommend the policy not allow flow augmentation from surface intakes as an acceptable component of a desalination facility.

3) The policy should not yet allow mitigation through Marine Protected Area modifications.

The policy would allow compensatory mitigation in the form of expansion, restoration, or creation of Marine Protected Areas. Although this approach might, at some point, represent appropriate mitigation for the adverse effects of a desalination facility, it currently cannot be implemented. For example, there are currently no methods available for translating ETM/APF calculations into MPA improvements, and no mechanisms to identify the performance standards, contingency measures, financial assurances, or other standard mitigation requirements using this mitigation approach. Additionally, there is little certainty provided using this process, as developing or modifying an MPA requires extensive public involvement and outreach that would likely result in significant changes to a particular mitigation proposal, thereby reducing the certainty that it would provide the expected type and level of necessary mitigation. We therefore recommend the policy not provide for this type of mitigation until the involved agencies and stakeholders develop the methods and mechanisms needed to ensure that this approach can provide the necessary level of mitigation. At that point, the policy could be amended as necessary, and we would be happy to coordinate with the Board and other agencies and stakeholders to develop both the necessary mechanisms and policy amendments.

4) The policy should acknowledge that the assessment of the economic feasibility of a proposed project requires consideration of factors that are beyond the scope of the policy.

We understand and concur with the policy's inclusion of the CEQA definition of feasibility, which is the same as the Coastal Act definition. However, we recommend the policy acknowledge that assessment of economic feasibility requires consideration of factors that are outside of the scope of policy. As described below, the Boards and other involved agencies will need to evaluate factors other than those within the purview of the policy as part of any economic feasibility determination.

The policy establishes guidance as to how the Boards are to evaluate the feasibility of alternative intake and discharge methods – e.g., consider different sites, designs, technologies, etc., – for their technical feasibility, economic feasibility, etc. The policy requires consideration of a project's life cycle costs, which will allow a Board to develop a common "currency" among alternatives – for instance, a comparison of the costs per acre-foot of water produced from each alternative. It appears that the policy assumes that the result will allow the Board to determine whether a more expensive alternative is economically feasible or infeasible, but it would not. The comparative costs of different alternatives have very little to do with determining their economic feasibility. The economic feasibility of a particular water project or alternative is based primarily on its role in the local or regional water supply portfolio and on how it will affect water rates in that area, both of which are outside of the policy's purview.

The two examples below show how the cost per acre-foot of a particular facility or alternative have little to do with its economic feasibility:

Example 1 – Effects on Portfolio Costs: This example is based on a simplified version of the Orange County water portfolio. The County uses about 800,000 acre-feet ("af") of water per year. Assuming that its current sources – primarily imported water and groundwater – cost an average of $1000 per acre-foot:

Existing water sources:	**Volume (in af):**	**Cost (per af):**	**Total cost:**
Imports and groundwater	800,000	$1000	$800,000,000.
			Average cost per af: $1000

If the County were to replace seven percent of its water portfolio with water from a desalination facility that costs $2000 per acre-foot, or twice as much as its other sources, it would increase the average cost per acre-foot by just $70, or 7%:

Existing water sources w/desal replacement:	**Volume (in af):**	**Cost (per af):**	**Total cost:**
Imports and groundwater	744,000	$1000	$744,000,000.
Desal @ $2000 per af	56,000	$2000	$112,000,000.
Total volume:	800,000		$856,000,000.
			Average cost per af: $1070

If water from an alternative design of that desalination facility were to cost three times as much – i.e., $3000 per acre-foot – it would add $140, or 14% to that average cost per acre-foot, as shown below:[4]

Existing water sources w/desal replacement:	**Volume (in af):**	**Cost (per af):**	**Total cost:**
Imports and groundwater	744,000	$1000	$744,000,000.
Desal @ $3000 per af	56,000	$3000	$168,000,000.
Total volume:	856,000		$912,000,000.
			Average cost per af: $1140

However, even with desalinated water costing two or three times that of the other water sources, the resulting 7-14% increase in the average cost can be an economically acceptable increase to the water districts and end uses, based on how that increase is reflected in water rates. Continuing the Orange County example, water rates there vary by district from less than $2 per unit to more than $4 per unit (a unit is 100 cubic feet, or

[4] ***Note:*** the effect on the average cost is slightly less when desalinated water is meant to <u>add</u> to the portfolio rather than serve as a replacement supply:

Existing water sources <u>plus</u> desal:	**Volume (in af):**	**Cost (per af):**	**Total cost:**
Imports and groundwater	800,000	$1000	$800,000,000.
Desal	56,000	$3000	$168,000,000.
Total volume:	856,000		$968,000,000.
			Average cost per af: $1130

748 gallons). An average household (2.5 people) using 125 gallons per person per day at $3.40 per unit (which is the per unit cost in Orange County's Mesa Water District) would use about 9375 gallons (or 0.029 acre-feet) of water per month and would currently pay about $42.61 for that water. Adding the above per acre-foot increase in the average portfolio cost ($70 and $140) for desalination would add $2.03 and $4.06 (or 4.8% and 9.5%), respectively, to this average household monthly bill.

Importantly, these increased costs are well within the expected increases local water districts have identified for incorporating desalination into their water portfolios, which have ranged up to about $8 per month per average household. So – even if a proposed desalination facility and an alternative to that facility represent costs that are two and three times the cost of other sources, they both appear be both economically acceptable and economically feasible when combined with other lower cost sources.

Example 2 – Rate Structures: In San Diego County, the Water Authority is proposing to structure its water rates to buffer the comparatively high cost of desalinated water by adopting a rate that combines that cost with a relatively low cost supply under a "Supply Reliability Charge."[5] This Supply Reliability Charge would assign costs of these two water supplies to the Authority's member agencies using a formula that balances each agency's actual use of those water supplies with the overall benefits accrued by all member agencies through having these two reliable supplies be a part of the region's water portfolio. Importantly, and just as in the Orange County example above, the Authority's costs for desalination are about twice that of the lower cost water supply.[6] Even with this range of costs, the average cost per acre-foot remains well below the higher average cost of desalination.

These examples illustrate that significantly higher costs per acre-foot among different water sources, or among alternative versions of a proposed desalination facility do not determine whether the more expensive ones are economically feasible or infeasible. It is far more important to consider the effects of a project's costs on the overall average portfolio costs and on an area's water rates, both of which are outside the purview of the Boards.

We recommend the policy provide additional direction on this issue. For example, the policy states that the Boards "may evaluate other site- and facility-specific factors," but we recommend it include specific guidance directing the Boards to consider a more comprehensive set of considerations when characterizing a project's economic feasibility, including the effects of a project and its alternatives on average portfolio costs and water rates, on the role of potentially higher rates in providing a "local reliability premium," etc. We expect that additional policy guidance requiring a more comprehensive evaluation will better characterize the economic feasibility of projects and their alternatives.

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[5] See http://www.sdcwa.org/sites/default/files/files/2015_03_12_SpecialAF.pdf

[6] See http://sandiego.alumclub.mit.edu/s/1314/clubs-classes-interior.aspx?sid=1314&gid=196&calcid=25793&calpgid=61&pgid=252&ecid=36680&crid=0

5) The policy's "needs" test should be based on a more detailed description of expected reliance on a proposed desalination facility.

The policy's Section L.2.b.(1) includes as part of its site considerations a "needs" test, which would require that the identified need for water to be provided by a proposed desalination facility be consistent with any of several plans, including a county general plan, an integrated water resource management plan, or an urban water management plan. We concur with the concept of the proposed changes to base an identified need for desalinated water on a focused group of documents. However, most of these plans are very general in nature and express no more than general support for desalination or for local water sources – for example, they often identify a target volume for future local water supplies or from local reliability projects, such as groundwater, seawater desalination, conservation, etc. However, they do not provide an adequate level of detail to determine whether a particular proposed desalination facility is consistent with identified local or regional water needs.

We recommend instead that this list be further focused to require that the identified need be consistent with the projects and amounts of water identified in a current Urban Water Management Plan (UWMP) pursuant to Section 10631(h). This section of the Water Code requires that UWMPs identify the specific projects and water volumes that water districts expect to rely on to serve an area's water needs under normal, dry, and multiple dry years for the upcoming twenty years of projected water demands. This section of a UWMP usually describes the planning and budget needed to allow those projects to become part of the local water portfolio, and the degree of forethought and planning needed to develop these projections provides a far more appropriate basis for the desalination policy's needs test than the general statements contained in the other planning documents. Additionally, incorporating a desalination facility into an area's water portfolio generally requires a great deal of up front design and planning related to system hydraulics, chemical compatibility of different water sources, etc., The projects identified in a UWMP pursuant to this section of the Water Code reflect a degree of commitment, planning, and engineering by a water district that Regional Boards can rely upon with greater certainty as compared to proposed project descriptions in the other more general planning documents listed above. Further, because UWMPs are updated every five years, they reflect a water district's relatively current design and planning considerations.

We therefore recommend that Section L.2.b.(1) of the amendment be further modified as follows:

> "Consider whether the identified ~~regional~~ need for desalinated* water ~~identified~~ is consistent with ~~any~~ the Section 10631(h) provisions of an applicable ~~adopted general or coordinated plan for the development, utilization or conservation of the water resources of the state, such as a county general plans, an integrated regional water management plans, or an~~ urban water management plans~~, or other water planning documents if these plans are unavailable~~ or equivalent planning document if an urban water management plan is not available."

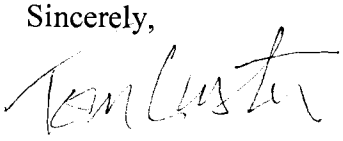
Additionally, and as an example of the coordination necessary in reviewing proposed desalination facilities, most coastal projects will be subject to Local Coastal Program ("LCP") requirements that address expected levels of development, the need to support coastal-dependent

uses, coastal-related uses, visitor-serving uses, and other considerations. The policy need not reference LCPs in the above section, but, as noted previously, should acknowledge the need for interagency coordination for these projects.

CONCLUSION

Thank you for the opportunity to comment, and again, thank you for the extensive coordination and outreach provided by your staff. Please contact me at 415-904-5248 or tluster@coastal.ca.gov if you have any questions or would like clarification of any of these comments.

Sincerely,



Tom Luster
Energy, Ocean Resources, and Federal Consistency Division