

August 19, 2014

**Public Comment  
Desalination Amendments  
Deadline: 8/19/14 by 12:00 noon**

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



**SUBJECT: Comment letter – Desalination Amendments**

Dear Ms. Townsend:

CalDesal and the Association of California Water Agencies (ACWA) are pleased to submit the following comments in response to the State Water Resources Control Board’s (Board) publication of the draft staff report, draft amendment to the Ocean Plan, and the draft substitute environmental documentation. CalDesal members generally find the draft is positive and productive, and we appreciate the opportunities for stakeholder involvement provided by the Board and staff. However, we have several concerns that we wish to bring to your attention.

CalDesal is a nonprofit association of water agencies and other entities that advances the use of desalination and salinity management as important options for local and regional sustainable water supply reliability. CalDesal has actively participated in the Board’s California Ocean Plan Amendment process from the start. During this long process, CalDesal has previously raised several issues for the Board to consider in developing regulations specific to desalination facilities, both ocean and groundwater desalination including:

1. The Board should and we believe does recognize desalination as an important local and regional sustainable water supply and reliability option in order to improve water supply reliability, to help reduce reliance on imported water and in the face of climate change, to better meet future regional and local needs.
2. The Ocean Plan Amendments should recognize the site-specific nature and unique marine habitat at each proposed location for a desalination facility. The salinity objective should be based on site-specific species that could be impacted by the facility. Feasible intakes and brine disposal methods require site specific investigation to determine the most cost-effective approach that is protective of water quality and would produce the necessary supply capacity for the project.
3. The Ocean Plan Amendments need to incorporate a definition of “feasibility” that takes into consideration economic feasibility when applying the amendment provisions which is consistent with CEQA.
4. The Ocean Plan Amendments should not identify a preferred “Best Available” technology over others. The Ocean Plan Amendments should establish a standard based on sound science for intakes and brine disposal, and allow a project proponent to develop the most suitable technology and design that meets both the project’s capacity needs and that meets the

objectives of Section 13142.5(b) of the water code. There should be only a one track approach to intakes and not the two track approach for intakes as originally proposed by staff.

5. CalDesal is open to a mitigation fee, but we believe it is critical that the fee have a direct nexus to the potential impacts of a project and that it should be calculated and applied one time to cover all marine organism mitigation requirements for a project, inclusive of all state permitting agencies. Assuming the Board is able to develop a mitigation fee that CalDesal and other stakeholders can support, CalDesal submits that each desalination project proponent should have the option of paying the mitigation fee or building their own mitigation project or utilizing an existing restoration project. Moreover, CalDesal is ready to work with the appropriate state agencies to pass legislation to set up the mechanics for the mitigation fee. In addition, the magnitude and significance of the impacts on the overall marine environment should be understood in context to the larger issues of concern: overfishing and pollution.
6. The Ocean Plan Amendments should allow alternative brine discharge technologies where such technologies used in conjunction with site-specific conditions would result in marine life protection comparable to that of other methods that would meet the Section 13142.5(b) requirements. Such technologies include flow augmentation and co-mingling with wastewater discharges. With respect to brine discharge from brackish groundwater recovery facilities, co-mingling with treated municipal wastewater should be allowed as long as receiving water objectives are met. Furthermore, the point of compliance for such facilities should be at the end of the Zone of Initial Dilution for wastewater outfalls or at the end of the Brine Mixing Zone for dedicated multiport brine disposal lines.
7. Existing or planned facilities that have been approved by the California Coastal Commission as of the effective date of the Ocean Plan Amendments should be considered “existing facilities.” Application of the Ocean Plan Amendments to “existing facilities” should be limited to desalination plants that are required to submit a new report of waste discharge due to significant changed conditions. All new and expanding desalination facilities must comply with requirements in the Ocean Plan Amendments. The Ocean Plan Amendments should include an exemption for existing and future facilities with intake capacities less than a certain size to be determined through further discussion between the State Board and stakeholders.
8. CalDesal supports the protection of larval, juvenile, and adult stages of marine life through the use of marine protective technologies (e.g., wedge wire screens) to avoid impingement and minimize entrainment losses. Project applicants should be credited for using such marine protective technologies when calculating Empirical Transport Model (ETM) for mitigation purposes since the ETM methodology assumes open intakes.
9. The entrainment study requirements set forth in the desalination amendments should be consistent with standard protocols for such studies including but not limited to 12 month duration, 335 micron mesh nets, study specific confidence intervals, and allowance for use of existing data collected using standard protocols. The approach recommended by CalDesal, discussed in further detail below, is called the Reproductive Ocean Impact Methodology (ROIM). This procedure synchronizes existing methodologies recommended by the Expert Review Panel’s final report<sup>1</sup>, Empirical Transport Model (ETM) and the Area

of Production Forgone (APF). This approach also integrates the Whole Life Cycle Methodology to calculate total entrainment and mitigation.

CalDesal is grateful that the Board staff took into consideration many of our previous comments. However, as indicated earlier, we respectfully submit the attached comments to the current staff draft. CalDesal and our members would be happy to meet with staff to discuss these comments further. Please contact me directly if you have any questions.

Sincerely,



Ron Davis  
Executive Director  
CalDesal



David E. Bolland  
Senior Regulatory Advocate  
Association of California Water Agencies

## General Comments

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### Definition of the term “feasible”

It is important that this term be defined and be consistently utilized. It should be noted that in the recent Court of Appeals Decision in *Surfrider Foundation v. Cal. Regional Water Quality Control Board*, 211 Cal. App. 4th 557 (2012), the court upheld the use of the definition of “feasible” under CEQA. Under CEQA, “feasible” means “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors”. The Coastal Act relies on the same definition. For consistency, the SWRCB should incorporate this same definition and include it under Definitions. Page 17 – Add Definition of “Feasible”:

FEASIBLE means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors.

### Clean Up Inconsistent Language

Section 13142.5(b) application to intake and brine disposal should be made consistent throughout the document. The terminology, “Best available site, design, technology and mitigation feasible...” needs to be consistent and used throughout the document. For example, Page 2, sections L.1.c. and L.2. – “Best available” needs to be inserted before site, and “feasible” inserted after Measures. There are other places in the document where similar abbreviated versions are used and these should be all made the same per 13142.5(b).

## Application of Water Code Section 13142.5(b)

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### 13142.5(b) Determination Process

Page 2. L.2.a. This section describes how regional boards would conduct 13142.5(b) determinations with guidance from the SWRCB.<sup>1</sup> Their determinations would be based on information provided by the project proponent. We are concerned that the regional boards would in essence have the ability to make critical design decisions regarding intakes, yet lack technical expertise and resources to carry out the provisions in this section. We urge the SWRCB to consider restructuring this section. Project proponents should submit 13142.5(b) studies and determination analysis using the same guidelines described. Regional boards would then be responsible for reviewing the project applicant’s best available site, design, technology and mitigation measures feasible to make their determinations and ensuring it is consistent with this section with support from the SWRCB. We recommend that the second sentence in the first paragraph on Page 2 under item 2.a.(1) be changed to read:

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<sup>1</sup> Note that Water Code Section 13142.5(b) governs “new or expanded coastal powerplant or other industrial installation using seawater for cooling, heating, or industrial processing.” It is questionable whether desalinating seawater for potable use should be considered “industrial processing.” The statute appears to cover facilities that use seawater to assist with industrial operations, it does not appear to contemplate the use of seawater as the source and product of treatment. Moreover, it is also unclear whether subsurface intakes would be covered by Section 13142.5(b).

“This request shall include sufficient information that demonstrates that the project provides the best available site, design, technology and mitigation measures feasible which shall be used to minimize the intake and mortality of all forms of marine life in its request for a Water Code section 13142.5(b) determination to for the regional water board to conduct the analyses described below.”

### **Consultation with other agencies.**

Page 3. L.2.a.(4). This provision requires regional boards to consult with other state agencies but states the regional boards would not be limited by prior rulings made by these agencies. Allowing regional boards to add on to rulings made by other agencies after the fact undermines the permitting process and creates regulatory uncertainty. We suggest this section require the regional boards to consult with and make consistent their determinations with other state agencies.

### **Size of project must be left to the project proponent.**

Page 4. L.2.b.(1). This provision (under determination of the best site available), brings into the Ocean Plan the determination whether the proposed ocean desalination facility is needed and whether the proposed project is consistent with an integrated regional water management plan or an urban water management plan and County or City general plans regarding growth. This determination is beyond the scope of the statutory requirement under Section 13142.5, as project size is clearly not part of the determination of the best available site, design, technology or mitigation.

Water supply agencies, not the State Board or Regional Boards, are responsible for determining the need for local resource developments. Water supply agencies typically utilize a diverse set of water sources to provide a reliable supply to ensure that the basic health and safety demands of California can be met on a near- and long-term basis.

Typically, the need and sizing options for a project are considered long before permitting for the project begins. This includes any number of water agency plans and evaluations. Need is considered during the project planning phase and CEQA process before permits such as the Coastal Development and NPDES permit are obtained. This provision has the potential to undermine water agency resource plans, CEQA, and related documents after the fact and is not the function of the Regional Boards.

For these reasons we urge the SWRCB to consider removing this provision. In the event that the SWRCB keeps this provision, it should be expanded to also include water agency Water Master Plans, Water Resource Plans, Regional Integrated Water Resources Plans, Water Reliability Plans, and related facility planning documents.

## **Intake Regulations**

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### **Determination that Subsurface Intakes are infeasible by the Regional Board.**

Page 6, L.2.d.(1)(a)i. allows the Regional Board to make a determination that subsurface intakes are infeasible based on their analysis of specified criteria, including “presence of sensitive habitats, presence of sensitive species, energy use, impact to freshwater aquifers, local water supply, and

existing water users...” This section should allow mitigation of impacts and not be solely used by the Regional Board to determine that a subsurface intake is infeasible due to a finding of the presence of any of these criteria. The following language should be added: “Project mitigation measures and monitoring programs that would minimize impacts to coastal resources shall be considered by the Regional Water Board in such determinations.”

### **Feasibility re: lifecycle cost/site specificity**

Page 6. L.2.d.(1)(a)i. on page 6 defines factors to be considered in determining if a sub-surface intake is infeasible, and includes “life-cycle” costs as a factor. We agree that project life-cycle costs should be considered. However, due to site- and project-specific variables, the pre-treatment benefits of sub-surface intakes and related maintenance costs must be considered on a case by case basis. For example, beach wells may encounter Iron and Manganese water quality issues that could require higher pre-treatment costs. Likewise, maintenance costs for infiltration galleries and other alternative intakes are relatively unknown and could be significant. We request the SWRCB consider adding language to clarify that actual life-cycle cost estimates will be used in the feasibility analysis, as generic cost savings estimates would not be applicable to all projects.

### **Siting Issues**

Page 4. L.2.b.(6): This provision requires intakes and outfalls “to the extent feasible” to be sited to maximize the distance from MPAs and SWQPAs. Later provisions also call for using ETM – empirical transport modeling to estimate intake entrainment areas. The ETM entrainment areas for most intakes will almost always include MPAs. New intakes and outfalls are already disallowed in MPAs and other protected areas.

We agree that MPAs and other protected areas are important and need to be considered in the 13142.5(b) determination. Depending on site-specific variables, it is possible that the most protective available intake site might not be the maximum distance from an MPA or MPA cluster. For instance, the maximum distance from two MPAs could be sensitive rocky bottom habitat that could otherwise be avoided. Consider adding language to clarify these types of cases or provide additional guidance.

Also, the presence of a MPA in the ETM zone of a potential intake should not be the grounds for infeasibility for screened or alternative intake. Consider adding a statement that once the 13142.5(b) determinations regarding the best site, design, technology and mitigation are complete, the intakes are sufficiently protective of MPAs. The presence of an MPA in a project’s ETM entrainment zone should not be cause for disallowing a screened open water intake. Otherwise, there would be nowhere along the coast where they could be sited. We would also oppose any effort to make the presence of an MPA in an ETM zone used as justification for additional mitigation in the APF calculations, as they would already be accounted for in the APF methodology. The staff report on page 61, Section 8.4.4 suggests studies may be used “to demonstrate to the regional water boards that a surface intake will not impact a SWQPA or MPA.” We recommend adding this option in the Ocean Plan amendments.

Assuring a “no impact” standard is impossible to comply with as it is possible that some slight increase in salinity from the discharge could reach an MPA or SWQPA under unusual ocean conditions. Since there is natural variation in ocean salinity, it would be difficult to comply with an

average condition and this should be changed to not exceeding the natural salinity that would occur at any time.

Based on these comments, we suggest the following modifications:

Page 4. L2.b.(2) – Change “avoid” to “minimize” to be consistent with Section 13142.5(b).

Page 4. L2.b.(6):

“Discharges shall be sited at a sufficient distance from a MPA or SWQPA based on dispersion modeling so that there are no significant impacts from the discharge on a MPA or SWQPA ~~and so such~~ that the salinity within the boundaries of a MPA or SWQPA does not exceed natural ~~background~~ salinity. ~~To the extent feasible, intakes shall be sited so as to maximize the distance from a MPA or SWQPA.”~~

### **Combining surface and open ocean intakes**

Page 6. L.2.d.(1)(a)ii. It is hard to imagine a project where constructing two separate intakes would be a preferred intake alternative. First, there would be the construction costs and marine environment impacts for two intakes instead of one. There would likely also be increased on-shore environmental and land use impacts from additional required infrastructure. The added construction and mitigation costs would likely make this option infeasible from a life-cycle cost perspective. Also, using a combination of intakes creates potential treatment design and operational issues due to the different source water qualities.

For these reasons, we request the SWRCB to consider removing this provision or at least clarifying how it would and when it would be applied.

### **Recommendation for screen size is 1mm.**

Page 6. L.2.d.(1)(c)ii: The SWRCB has solicited advice for what screen size to require for open water intakes. We note first that wedge-wire and related screens have not been implemented in a full scale project in the marine environment, and project proponents are acting in good faith in supporting this alternative and performing additional research to ensure this is a viable option and protective of the marine environment.

West Basin MWD (West Basin) has completed several studies of wedge-wire screen performance in the past few years. West Basin’s most recent research evaluated 0.5 mm, 1.0 mm, and 2.0 screens in real-world operating conditions. The results of the study showed 0.5 mm screens are susceptible to fouling and clogging in real-world conditions, whereas 1.0 mm and 2.0 mm screens were significantly less prone to fouling. Screen fouling is a crucial factor in slot size selection. Frequent fouling increases intake maintenance costs and potentially elevates intake velocities in areas of the screens that are not fouled. Results of West Basin’s studies, as well as similar studies performed by the Santa Cruz Water District, have been provided to SWRCB staff and the expert panels. West Basin is conducting additional studies on material selection for wedge-wire screens to address the high corrosion and biofouling potential of the marine environment. CalDesal supports West Basin’s recommendation that the SWRCB require a slot size of no smaller than 1.0 mm. Screens with 1.0 mm slot sizes can eliminate impingement, and balance significantly reduced entrainment impacts with minimized screen fouling.

## **Brine Disposal, Discharge and Receiving Water Limitations**

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**As proposed, potential for recycling would prohibit co-disposal of brine with municipal wastewater.**

Page 7. L.2.d.(2)(a). For this provision, we suggest the following modification:

“The preferred technology for minimizing mortality of marine life resulting from brine\* disposal is to commingle brine\* with wastewater (e.g., agricultural, sewage, industrial, powerplant cooling water, etc.) that would otherwise be discharged to the ocean, ~~unless the wastewater is of suitable quality and quantity to support domestic or irrigation uses.~~”

We deleted “unless the wastewater is of suitable quality and quantity to support domestic or irrigation uses” for a number a reasons. First, while water reuse and recycling should certainly be encouraged many factors play into whether reuse and recycling are feasible, and it should be up to the water agencies to determine whether the water can be reused or recycled. The suitability of the water in and of itself should not preclude a desalination facility from being able to commingle its brine effluent with the wastewater. In any event, if a future recycling project is planned which may reduce the volume of wastewater available for the dilution of brine, a regional water board may condition the permit on the availability of the wastewater pursuant to Section L.2.a.(5).

For purposes of commingling brine discharge with wastewater for disposal, the standard water quality objectives, testing and mixing zone analysis appropriate to POTW discharges should apply. Such standards allow for a zone of initial dilution and impacts are assessed outside of this zone of initial dilution. This is consistent with the Expert Panel’s recommendation that brine discharge be regulated by the mixing zone approach where water quality standards must be met at the mixing zone boundary:

“Because discharges can be designed to result in rapid initial dilution around the discharge, we recommend that they be regulated by a mixing zone approach wherein the water quality regulations are met at the mixing zone boundary. The mixing zone should encompass the near field processes, defined as those influenced hydrodynamically by the discharge itself. These processes typically occur within a few tens of meters from the discharge, therefore we conservatively recommend that the mixing zone extend 100 m from the discharge structure in all directions and over the whole water column.”

(Management of Brine Discharges to Coastal Waters Recommendations of a Science Advisory Panel, March 2012, Executive Summary at ii) (emphasis added).

“Water quality objectives must be met at the edge of a regulatory mixing zone that extends vertically through the water column up to 100 m from the discharge structure in all directions.” (Id. at 45)

To require impact analysis and mitigation of these impacts within the brine mixing zone appears to be inconsistent with the Expert Panel’s recommendation and the existing regulatory scheme. As such, we propose the following modifications:

Page 7. L.2.d.(2)(c).

“the owner or operator to analyze the brine\* disposal technology or combination of brine\* disposal technologies that best reduces the effects of the discharge of brine\* on marine life due to intake-related entrainment, osmotic stress from elevated salinity,\* turbulence that occurs during water conveyance and mixing, and shearing stress at the edge of the brine mixing zone or zone of initial dilution ~~point of discharge.~~”

Page 8. L.2.d.(2)(d).

“Brine\* disposal technologies other than wastewater dilution and multiport diffusers,\* such as flow augmentation,\* may be used if an owner or operator can demonstrate to the regional water board that the technology provides a comparable level of protection. The owner or operator must evaluate all of the individual and cumulative effects of the proposed alternative discharge method on marine life mortality, including (where applicable); intake-related entrainment, osmotic stress, turbulence that occurs during water conveyance and mixing, and shearing stress at the edge of the brine mixing zone or zone of initial dilution ~~point of discharge. . . .~~”

### **Brine Mixing Zone and Mitigation**

Page 9. L.2.e. For facilities which commingle brine with wastewater as a discharge option, the NPDES permit governing the wastewater discharge should be fully protective of marine life impacts. So long as the brine does not result in any exceedance of NPDES permit limits, compliance at the edge at the zone of initial dilution should be sufficiently protective of marine life impacts and should not require any further mitigation. Consistent with the above comments on brine mixing zone and compliance, we suggest the following changes to this provision:

“Mitigation for the purposes of this section is the replacement of marine life or habitat that is lost due to the construction and operation of a desalination facility\* after minimizing marine life mortality through site, design, and technology measures. The owner or operator may choose whether to satisfy a facility’s mitigation measures pursuant to chapter III.L.2.e.(3) or, if available, L.2.e.(4). The owner or operator shall fully mitigate for all marine life mortality associated with the desalination facility.\* With respect to brine disposal, where wastewater is commingled with brine as a disposal option, so long as the NPDES permit discharge water quality standards are met, compliance at the edge of the zone of initial dilution\* shall be presumed to be fully protective of marine life impacts sustained from brine disposal.”

## **Brine Discharges and Shear Stress Mortality**

As discussed above, analysis of impact should occur outside of the mixing zone or zone of initial dilution. The requirement to evaluate shearing impacts should not apply to commingled brine/wastewater discharge. Existing POTWs are not required to mitigate for entrainment and shearing losses that might occur from wastewater disposal within the zone of initial dilution. Such losses are expected to be quite low or non-existent for the low pressure wastewater outfall diffusers. The Expert Panel recognized that there is no published evidence of mortality due to diffuser jets and that shearing losses from diffusers would likely be low because exposure to damaging turbulence is on the order of seconds. (See Desalination Plant Entrainment Impacts and Mitigation, October 9, 2014 at p.3). The Expert Panel noted that “literature reports of damage to larvae caused by turbulence are generally based on longer exposure times.” (See id.). Given the lack of scientific evidence demonstrating the potential for mortality impacts from diffusers, we recommend the following modifications to this provision:

Page 9. L.2.e. Add the following to the end of the paragraph:

...The owner or operator shall fully mitigate for all marine life mortality associated with the desalination facility. “This provision shall not apply to brine disposal by commingling with wastewater.”

Page 10. L.2.e.(1)(b) Modify as follows:

“For operational mortality related to discharges, the report shall estimate the area in which salinity\* exceeds 2.0 parts per thousand above natural background salinity\* or a facility-specific alternative receiving water limitation (see § L.3) outside of the brine mixing zone\* or zone of initial dilution\*. The area in excess of the receiving water limitation for salinity\* shall be determined by modeling and confirmed with monitoring. The report shall use any acceptable approach for evaluating mortality that occurs due to shearing stress resulting from the facility’s discharge, ~~including any incremental increase in mortality resulting from a commingled discharge.~~ “This section does not apply to commingled brine discharges with wastewater.””

### **Receiving Water Limitation for Salinity - Compliance with “Natural Background Salinity” as worded is non-attainable.**

Page 13. L.3. Under Receiving Water Limitations for Salinity, the “natural background salinity” is to be used. The definition provided for “natural background salinity” is a 20 year average or a site specific average based on new data collected at the discharge point on a weekly basis over 3 years. Using long term averages would make it impossible to comply with the allowable 2,000 mg/l maximum incremental increase above ambient or reference salinity when natural salinity levels exceed their average condition. Instead, we would recommend using natural salinity conditions.

### **Receiving Water Limitation for Salinity, the Alternate Method should allow use of site specific most sensitive species that are found in the impacted habitat.**

Page 14. L.3.c.(1)(b). To provide for appropriate flexibility without causing any additional impact, site specific habitat species that occur and would be affected by the discharge should be used in the determination of the appropriate receiving water limitation for salinity. For example, it makes no

sense to use rocky habitat species in sandy or muddy bottom habitats and vice versa. It would seem better to use the most sensitive species that have developed protocols for the impacted habitat. Otherwise, this provisions undermines the site-specific allowances in the provision, as the limit would never be lower than the 2,000 mg/L found in the expert panel.

### **Receiving Water Limitation for Salinity: No Observed Effect Level versus Lowest Observable Effect Level**

Page 14. L.3.c.(3). The procedure set forth in the OPA for establishing facility-specific receiving water limits uses a *different, and more restrictive*, standard of salinity than the standard that is used as a guideline throughout the entire draft OPA. Throughout the draft OPA, and throughout Roberts et al. 2012 (upon which much of the draft OPA is based), it is stated that red abalone are the most sensitive species tested, with a LOEL (Lowest Observable Effect Level) of 35.6 ppt – or approximately 2.1 ppt above ambient (in southern California waters). Thus, it is argued, a maximum regulatory salinity increase of 2 ppt is reasonable because it protects the most sensitive species. However, the language in the draft OPA for alternative receiving water limitations uses a completely different standard, which is NOEL (No Observable Effect Level). The NOEL value, according to Philips et al. (2012) is 34.9 ppt, or approximately *only 1.4 ppt above ambient* (in southern California waters). Consequently, an operator that wishes to establish a site-specific receiving water limit under the OPA is being held to a more restrictive salinity standard. CalDesal requests that the OPA be amended such that the facility-specific alternative receiving water standard be based on the same standard that will be used to establish the statewide receiving water limit of 2 ppt – the lowest observed effect level (LOEL).

### **Monitoring Reporting Plan and Brine Mixing Zones**

Page 16. L.4.a.(1): “Facility-specific monitoring” should be clarified, particularly for commingled brine and wastewater facilities. Such monitoring should occur in the receiving waters at stations representative of the area within the waste field where initial dilution is completed, i.e., at the edge of the brine mixing zone or zone of initial dilution. In addition, we recommend the following changes to this provision:

“An owner or operator must perform facility-specific monitoring to demonstrate compliance with the receiving water limitation for salinity,\* and evaluate the potential effects of the discharge within the water column, bottom sediments, and the benthic communities. Facility-specific Monitoring is required until the regional water board determines that a regional monitoring program is adequate to ensure compliance with the receiving water limitation. Receiving water monitoring for salinity shall be conducted at the boundary of the defined brine mixing zone\* or zone of initial dilution\* and shall be conducted at times when the monitoring locations are most likely affected by the discharge. The monitoring and reporting plan shall be reviewed, and revised if necessary, upon NPDES permit renewal. The regional water board may require additional monitoring at the desalination facility, however, compliance with water quality objectives is to be determined at the edge of the brine mixing zone\* or zone of initial dilution\*.”

### **Definition of Brine Mixing Zone**

Page 16. The Definition of Brine Mixing Zone (BMZ) should be specified that it is for dedicated brine disposal discharge lines equipped with multiport diffusers and that it does not apply to

conventional wastewater outfalls that may be used for commingling brine for disposal. Further, the BMZ definition should be consistent with the mitigation requirements in the draft amendment and as now written would inadvertently prohibit brine disposal.

As currently defined, acutely toxic conditions are to be prevented in the BMZ. Whether brine discharge is considered acutely toxic depends on how dilution is factored in. If dilution is not factored in, it would be impossible to prevent acutely toxic conditions. When brine first enters the ocean from the diffuser it is about twice the concentration of seawater undergoing dilution in the BMZ and would be acutely toxic. The very purpose of the BMZ is for dilution of the brine to prevent acute and chronic toxicity from concentrated seawater at the edge of the BMZ. Acute toxicity should be met at the edge of the BMZ as recommended by the Expert Panel (September 23, 2013 workshop presentation and March 2012 Expert Panel Final Report). Granite Canyon Lab work provided chronic toxicity evaluations for brine but not for acute toxicity. It is not possible at this time to know if some distance within the BMZ could be established for acute toxicity as now done in the NPDES permits for wastewater outfalls for constituents other than salinity.

We recommend that under the definition for BMZ on page 16, that the third sentence of the definition be changed to read as follows:

“The brine mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely and chronic toxic conditions due to elevated salinity are prevented at the edge of the brine mixing zone and the designated use of the ocean water beyond the brine mixing zone is not impaired as a result of the brine discharge mixing zone.”

The draft Desalination Amendments also propose to limit the salinity increase to a maximum of 2 ppt over natural ocean salinity background, at a fixed distance of 100 meters from the point of discharge. The distance of 100 meters appears to be based on the multiport diffuser. (Staff Report at page 98). The Desalination Amendments definition for brine mixing zone includes a mechanism for establishing a larger brine mixing zone: “the brine mixing zone shall not exceed 100 meters ... unless otherwise authorized in accordance with this plan.” However, the Desalination Amendments currently do not include a process for establishing a larger brine mixing zone, which would limit the brine discharge to the multiport diffuser. This appears to be an oversight, and we recommend that it be addressed in follow-up revisions.

#### **Add definition of “zone of initial dilution”:**

Page 18. Definitions. We recommend the following definition be added to the amendment to the extent our proposed language above is adopted:

“ZONE OF INITIAL DILUTION is a regularly shaped area (e.g., circular or rectangular) surrounding the discharge structure (e.g., submerged pipe or diffuser line) that encompasses the regions of high (exceeding standards) pollutant concentrations under design conditions.”

## **Comments on Mitigation Provisions**

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### **Mitigation for Intakes**

**The following comments 1 through 4 apply to page 9-10, Section L.2.e.(1)(a):**

**L.2.e.(1)(a). Comment 1: Entrainment study duration:**

The OPA should permit the use of 12 months of entrainment data which conforms to the guidelines for entrainment impact assessment included in Appendix E of the Staff Report. (Guidance Documents for Assessing Entrainment Including Additional Information on the Following Loss Rate Models: Fecundity Hindcasting (FH), Adult Equivalent Loss (AEL) and Area of Production Forgone using an Empirical Transport Model (ETM/APF)). These guidelines, written by members of the SWRCB's Expert Review Panel, state that entrainment sampling that is done for 12 months is a reasonable period of sampling because the entrainment estimated by the ETM method is "much less subject to inter-annual variation. (Id. at 97.) Therefore, a 12 month study would be adequate to account for variation in oceanography conditions and larval abundance and diversity such that the abundance estimates are reasonably accurate. All of the intake assessments in California, except one, have been conducted for a period of one year. A 36 month study would be excessive and would cause potentially costly delays in project development. We urge the SWRCB to change the entrainment study period from 36 consecutive months to 12 consecutive months.

**L.2.e.(1)(a). Comment 2: 200 micron mesh not required:**

As noted on page 70 of the Staff Report, the Expert Review Panel III recommended the ETM/APF method that relies on the 335 micron mesh net to calculate mitigation levels because:

- This method has historically been used in California to determine mitigation for entrainment at power plants and is widely accepted in the scientific community;
- Compensates for all entrained species and not just commercially valuable fish taxa;
- Utilizes representative species (e.g. fish larvae sampled using a 335 micron mesh net) that can be used as proxy species for rare, threatened, or endangered species, which may be challenging to acquire adequate data for. The creation of habitat benefits all species in the food web regardless of whether or not they were assessed in the ETM/APF model.

**L.2.e.(1)(a). Comment 3: 90 percent confidence interval:**

Section L2e(1)(a). The uniform application of a 90 percent confidence interval does not take into consideration the varying levels of uncertainty associated with ETM/APF estimates. This proposal should be submitted for peer review by the Intake Expert Review Panel for review and guidance on development of a methodology for establishing the appropriate confidence interval based on site-specific interpretation of site specific entrainment data.

This is a concern because specifying a 90% confidence interval also has the potential to exponentially increase the acreage of land necessary to insure compliance if individual species curves are used. Appendix E shows exponential increases in required acreage after the 60% confidence interval. In Appendix E-164, the mitigation calculation for the Encina plant increases as much as 1.5 times from 80% to 90% confidence interval if individual species curves are used. If the SWRCB keeps the 90% confidence interval in the regulations, it should be based on the "Means of species" and not "Measurements from individual species" as shown in Appendix E.

**L.2.e.(1)(a). Comment 4: Use of existing entrainment data:**

Consistent with Section L2d(1)(c)iii, the OPA should allow the use of existing entrainment data that meets the guidelines in Appendix E.

Base on comments 1 – 4, CalDesal recommends the following revisions to L.2.e.(1)(a), pages 9-10:

For operational mortality related to intakes, the report shall include a detail entrainment study. The entrainment study shall be ~~at least 36~~ 12 consecutive months and sampling shall be designed to account for variation in oceanographic conditions and larval abundance and diversity such that abundance estimates are reasonably accurate. At their discretion, the regional water boards may permit the use of existing entrainment data for the facility to meet this requirement. Samples must be collected using a mesh size no larger than 335 microns and individuals collected to the lowest taxonomical level practicable. ~~Additional samples shall also be collected using 200 micron mesh to provide a broader characterization of other entrained organisms.~~ The ETM/APF analysis\* shall be representative of the entrained species collected using 335 micron net. The APF\* shall be calculated using a ~~90~~ 50 percent confidence interval between 50 and 90 percent to account for variation in the site-specific entrainment data. The actual confidence interval to be used by the regional water boards shall be consistent with the procedures established by the Intake Expert Review Panel. An owner or operator with subsurface\* intakes is not required to do an ETM/APF analysis\* for their intakes and is not required to mitigate for intake-related operational mortality. The regional water boards shall permit the use of existing entrainment data from the facility from studies conducted in conformance with the Guidelines for Entrainment Impact Assessment set forth in Appendix E.

### **Mitigation in brine mixing zone**

Page 10. L.2.e.(1)(b). Standard practice under the Ocean Plan is that dischargers do not mitigate for impacts within the ZID. Consistent with this approach, CalDesal recommends the following changes to this paragraph:

~~For operational mortality related to discharges, the report shall estimate the area in which salinity\* exceeds 2.0 parts per thousand above natural background salinity\* or a facility specific alternative receiving water limitation (see § L.3). The area in excess of the receiving water limitation for salinity\* shall be determined by modeling and confirmed with monitoring. The report shall use any acceptable approach for evaluating mortality that occurs due to shearing stress resulting from the facility's discharge, including any incremental increase in mortality resulting from a commingled discharge. No mitigation shall be required for brine concentrations in excess of 2 ppt in the brine mixing zone.~~

### **The following four comments apply to mitigation project requirements Page 11, Section L.2.e.(3)(b)ii:**

#### **APF sizing determinations**

Page 11. L.2.e.(3)(b)ii. Consistent with past APF siting and sizing determinations, the OPA should provide the regional water board sufficient flexibility to adjust the mitigation acreage as needed based on the expected productivity of the type of mitigation to be provided compared to the actual productivity within the facility's source water body. For example, the Coastal Commission (CCC) determined that 64 acres were needed to mitigate for the open ocean species entrained by the Carlsbad project. However, in recognition of the impracticality of creating 64 acres of offshore open water habitat and recognizing the relatively greater productivity rates per acre of estuarine wetlands habitats, the CCC allowed the offshore impacts to be "converted" to estuarine mitigation areas. The

CCC determined that successfully restored wetland habitat would be ten times more productive than a similar area of nearshore ocean waters. Based on this determination, for every ten acres of nearshore impacts, the Carlsbad project was allowed to mitigate by creating or restoring one acre of estuarine habitat. Although this approach would result in “out of kind” mitigation, the CCC found it would produce overall better mitigation because not only is it not practical to create nearshore, open water habitat, and that habitat type is already well-represented along the shoreline. Whereas creating or restoring coastal estuarine habitat types would support a long-recognized need to increase the amount of those habitat types in Southern California. (See E-06-013 – Condition Compliance for Special Condition 8, Poseidon Resources Corporation, Marine Life Mitigation Plan, December 8, 2008.)

### **Location of the mitigation project.**

Page 11. L.2.e.(3)(b)ii. Given the limited number of suitable mitigation sites, it would be impractical to limit site selection to the facility’s source water body. Consistent with past mitigation siting determinations, the OPA should provide the regional water board sufficient flexibility to site the mitigation acreage as needed based on the availability of suitable mitigation sites. For example, the CCC allowed the Carlsbad project to select from a number of suitable sites in the Southern California Bight for its restoration project. Following an exhaustive search in and around the Carlsbad facility’s source water, the Coastal Commission (CCC) determined that there were no suitable mitigation sites located directly with the project’s source water body, and the best available mitigation site for the Carlsbad project was located at the south end of San Diego Bay, a distance of 50 miles from the facility (See E-06-013 – Condition Compliance for Special Condition 8, Poseidon Resources Corporation, Marine Life Mitigation Plan, December 8, 2008.)

### **200 Micron Mesh.**

Page 11. L.2.e.(3)(b)ii. See comment 2 above. See also Expert Review Panel Report on Intake Impacts and Mitigation. Specifically page 1 of Appendix 1 which states in part: “The key assumption of APF that makes it useful ... it should reflect the impacts to measured and unmeasured resources (e.g., to invertebrate larvae). This is because its calculation assumes that those species assessed [those species captured on the 335 micron mesh] are representative of those not assessed [those species smaller than 335 micron]. Practically, this means that should the amount of habitat calculated using APF be created or substantially restored, the habitat will support species that were assessed as well as those that were not assessed in the ETM. Importantly, that amount of habitat will also compensate for impacts to species only indirectly affected. This means that should the mitigation take place according to APF estimates there will be no net impact.”

### **Compensatory Acreage for Mitigation Projects**

Page 11. L.2.e.(3)(b)ii. This provision also requires that “compensatory acreage” be added to a mitigation project if the mitigated area is affected by entrainment from the facility. It has the potential to create an endless loop where increased mitigation leads to increased entrainment requiring increased mitigation. Also, if the goal of mitigation is to restore similar habitat near the project site, this provision creates an incentive to locate projects far from the project. To avoid this possibility we suggest removing this provision.

**Based on the four preceding comments, CalDesal recommends the following revisions to Page 11. L.2.e.(3)(b)ii.**

The owner or operator shall demonstrate that the project fully mitigates for intake-related marine life mortality by including acreage that is at least equivalent in size, of the APF\* calculated in the Marine Life Mortality Report above, unless the regional water board determines that the mitigation habitat is of higher productivity than the facility's source water body (e.g., open ocean vs. estuarine mitigation habitat), in which case, the regional water board shall adjust the quantity of the mitigation acreage such that the productivity of the mitigation habitat provided matches that of the APF times the productivity of the source water body. The owner or operator shall attempt to locate the mitigation project within the facility's source water body,\* and shall do modeling to evaluate the areal extent of the mitigation project's production area\* ~~to confirm it overlaps the facility's source water body.\* Impacts on the mitigation project due to entrainment by the facility must be offset by adding compensatory acreage to the mitigation project.~~ The regional water board may require additional habitat for entrained organisms between 200 and 335 microns.

**Mitigation ratio should be linked to quality of restored habitat.**

Page 39, Section L.2.e. (3)(b) iii: Similar to the above comments, we recommend changes to this provision.

The owner or operator shall demonstrate that the project also fully mitigates for the discharge-related marine life mortality projected in the Marine Life Mortality Report. If the regional water board determines that the mitigation habitat is of higher productivity than the facility's source water body (e.g., open ocean vs. estuarine mitigation habitat), the regional water board shall adjust the quantity of the mitigation acreage required such that the productivity mitigation habitat provided fully mitigates for the discharge-related marine life mortality projected in the Marine Life Mortality Report. For each acre of discharge-related disturbances as determined in the Marine Life Mortality Report, an owner or operator shall restore one acre of habitat unless the Board determines that a mitigation ratio ~~greater~~ less than 1:1 is warranted due the higher productivity of the mitigation site compared to that of the disturbed area. ~~If needed.~~

**Mitigation of construction related marine life impacts.**

Page 12, Section L.2.e.(3)(b)iv. The following changes are intended to be consistent with the statement in OPA section 2.e.(1).(c) which states the regional water board may determine that the construction-related disturbance does not require mitigation because the disturbance is temporary and the habitat is naturally restored.

The owner or operator shall demonstrate that the project also fully mitigates for ~~the~~ any permanent construction-related marine life mortality projected in the Marine Life Mortality Report. For each acre of discharge-related disturbances as determined in the Marine Life

Mortality Report, an owner or operator shall restore one acre of habitat unless the Board determines that a mitigation ratio ~~less~~ greater than 1:1 is warranted due the higher productivity of the mitigation site compared to that of the disturbed area. The regional water board may determine that the construction-related disturbance does not require mitigation because the disturbance is temporary and the habitat is naturally restored, or has otherwise been mitigated by the owner or operator.

### **Mitigation Fee Flexibility**

Page 12, Section L.2.d.(4). SWRCB should permit both mitigation projects and a mitigation fee to account for the total facility impact and mitigation and not leave this decision up to the RWQCB. If and when a fee-based mitigation option is developed, we recommend the provision include assurances that the mitigation paid for covers the total required mitigation for all permitting agencies. We recommend the following revision for this section:

The SWRCB will allow both a project and fee based mitigation approach for a facilities impacts to be allowed. The mitigation fee should pay into a mitigation project that meets the requirements of L.2.e.(3).

## SED Comments

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We believe that the substitute environmental documentation (SED) is flawed in so far as it fails to consider the impacts of the proposed regulations to the extent that the regulations may limit ocean desalination and reduce the capacity of potential desalination projects due to additional costs and intake and discharge requirements. The threshold of significance referenced by the SED is that desalination projects in general can cause significant impacts to utilities and service systems if the Draft Amendments (the project) were to “require or result in the construction of new water or wastewater treatment facilities or the expansion of existing facilities, the construction of which could cause significant environmental effect.” (SED at p. 171). In their present form, the Draft Amendments present significant obstacles to ocean desalination projects including but not limited to the following:

- Requirement of subsurface intakes unless the regional water board determines that subsurface intakes are infeasible (L.2.d.(1)(a));
- Possible requirement of a less than 1.0 mm slot size screen for surface water intakes (L.2.d.(1)(c)(ii));
- Wholesale restriction on commingling brine with treated wastewater where the wastewater is of suitable quality and quantity to support domestic or irrigation uses (L.2.d.(2)(a)); and
- Requirements to analyze impacts at the point of discharge as opposed to the edge of the brine mixing zone (or zone of initial dilution for wastewater outfalls) (L.2.d.(2)(c) and (d)).

As discussed above, many of these requirements as written (and others) are problematic for water agencies, and they could preclude the development of many ocean desalination projects. If future ocean desalination projects are included in the water agencies’ plans and such projects are removed, other water supply projects or expansion of existing projects must be implemented. These potential replacement projects should have been analyzed for potential impacts.

Furthermore, the SED regulations state:

“In the preparation of the environmental analysis contained in subdivision (b)(4) [environmental analysis of reasonably foreseeable methods of compliance], the board may utilize numerical ranges or averages where specific data are not available; however, the board shall not be required to engage in speculation or conjecture. The environmental analysis shall take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites, but the board shall not be required to conduct a site specific project level analysis of the methods of compliance, which CEQA may otherwise require of those agencies who are responsible for complying with the plan or policy when they determine the manner in which they will comply.” (27 C.C.R. § 3777(c)).

We believe that the SED fails to perform an adequate environmental analysis of reasonably foreseeable methods of compliance. The SED purports to analyze the reasonably foreseeable

methods of compliance in the analysis of project alternatives yet it does not seem that economic and technical factors have been adequately considered. For example, such factors do not appear to have been adequately considered in the obstacles described above.