



February 20, 2019

David Gibson, Executive Officer
San Diego Regional Water Quality Control Board
2375 Northside Dr.
San Diego, CA 92108

CC: Brandi Outwin- Beals, Senior Water Resources Control Engineer
Ben Neill, Water Resource Control Engineer

Re: Follow-up Comments to Poseidon Water LLC's Carlsbad Desalination Plant stand-alone operations pursuant to Tentative Order no. R9-2019-0003 and NPDES no. CA010922

On behalf of the Surfrider Foundation and Orange County Coastkeeper (Organizations), we submit the following comments regarding Poseidon Water LLC's (Poseidon) Carlsbad Desalination Plant (Carlsbad plant) stand-alone operations pursuant to Tentative Order no. R9-2019-0003 and NPDES no. CA010922. These comments build upon our original comment letter submitted on January 28, 2019. We are submitting these additional comments because it has come to our attention that the application submitted by Poseidon for a renewed permit is for an "expanded" facility, as defined in the Ocean Plan amendment for desalination section III.M (OPA).

To reiterate, the Organizations have significant concerns regarding the Tentative Order (TO), its compliance with the State Water Resources Control Board (State Water Board) 2015 Ocean Plan with Desalination Amendment and the ability of the applicant to meet the proposed requirements set in the TO. As such, we urge you to consider the following comments.

As explained below, we believe that the considerations and alternatives for expanded facilities differ from those evaluated in the Tentative Order (TO).

1. Expanded Facilities

Section III.M.1.b.2 defines "expanded facilities" as:

For purposes of chapter III.M, "expanded facilities" means existing facilities for which, after January 28, 2016, the owner or operator does either of the following in a manner that could increase intake or mortality of all forms of marine life beyond that which was originally approved in any NPDES permit or Water Code section 13142.5, subdivision (b) (hereafter Water Code section 13142.5(b)) determination: 1) increases the amount of seawater used either exclusively by the facility or used by the facility in conjunction with other facilities or uses, or 2) changes the design or operation of the facility. To the extent that the



desalination facility is co-located with another facility that withdraws water for a different purpose and that other facility reduces the volume of water withdrawn to a level less than the desalination facility's volume of water withdrawn, the desalination facility is considered to be an expanded facility. [emphasis added]

The proposed facility meets this definition for two reasons - and we believe the distinction is important. The proposed facility significantly changes "the design or operation of the facility" by increasing the production capacity by 20% (from 50mgd to 60mgd) and modifying the discharge dilution by increasing the volume of brine discharged and decreasing the volume of seawater used for in-plant dilution.

The 2009 conditional permit describes a facility that withdraws 107mgd as source water for the production plant, creating 50mgd of potable water and 57mgd of brine to be mixed with 197 of dilution water. See Attachment "Carlsbad 2009 permit".

The current Tentative Order, at page H-1, describes an expanded plant as:

Under the current stand-alone operations as regulated under this Order, CDP intakes source seawater from Agua Hedionda lagoon at a flowrate of 299 MGD. 127 MGD of the source water will be used to produce up to 60 MGD of potable water. The remaining water that is not used for potable water production will be used to dilute the brine wastewater and other wastewater flows for Poseidon to meet the discharge salinity requirements of this Order. The discharge flow rate will vary in accordance with CDP operations. For example, at 50 MGD of potable water production, the discharge flow rate is 249 MGD (54 MGD of wastewater with 195 MGD of dilution water). At 60 MGD of potable water production, the discharge flow rate is 239 MGD (67 MGD of wastewater and 172 MGD of dilution water) into the Pacific Ocean.

The change of design and operation requires different considerations and alternatives analyses than the simpler analysis of an updated conditional approved facility.

Section III.M.2.a.3 states:

*The regional water board's Water Code section 13142.5(b) analysis for expanded facilities may be limited to those expansions or other changes that result in the increased intake or mortality of all forms of marine life, **unless the regional water board determines that additional measures that minimize intake and mortality of all forms of marine life* are feasible* for the existing portions of the facility.** [emphasis added]*

In brief, the current Tentative Order requires analyses of the applicability of the OPA to the "expanded" portion of the proposed facility, unless the Regional Board determines that additional modifications to the "existing" portion are feasible. It is not adequate to analyze the



proposed facility as a whole – the analyses must include a 13142.5(b) determination for the expansion in isolation of the conditionally approved facility.

2. Intake Alternatives

Water Code section 13142.5(b) requires analyses of the best available site, design, technology and mitigation feasible – both as individual components and in combination – to minimize intake and mortality of marine life. In brief, the OPA implementation regulations require the use of subsurface intakes unless they are proven not feasible. The production capacity is not allowed as a factor in the feasibility determination unless the applicant shows a “need” in an Urban Water Management Plan.

First, the Tentative Order Attachment H1-15 at section 10 states:

The UWMP describes the additional annual average potable water output potentially resulting from the proposed CDP modifications as an adaptive management supply that could be used to meet projected regional growth and water demands.

The language doesn’t satisfy the requirement to identify a “need” in an Urban Water Management Plan sufficient to allow an exemption from the requirement to use sub-surface intakes for the expanded capacity.

Even if the Urban Water Management Plan were adequate proof of “need” for the additional product water, the Tentative Order must be revised to include analyses of whether subsurface intakes would be feasible for the expanded production capacity expansion in isolation from the previous conditionally approved 50mgd capacity as required in III.M.2.a(3). The Tentative Order must answer the question: “can a subsurface intake feasibly supply water to a 10mgd production expansion?”.

3. Brine Discharge Alternatives

Sub-section M.2.d(2)(c) allows for “alternative” types of discharge technologies, including the requirements to do a “comparable marine life mortality” analysis. And section M.3.d describes how that works.

That sub-section [...d.(2)(c)] follows several that define dilution with wastewater as “best” and diffusers as “second best” where wastewater isn’t available. But that sub-section on “alternative discharge technologies” was only intended to allow future technologies that



weren't available when the OPA was adopted. Augmented flows is NOT an "alternative technology."

The very next sub-section, M.2.d(2)(d), makes it clear that augmented flow for dilution is prohibited (ie, NOT an "alternative technology") except in 2 circumstances:

- for facilities with a "conditional permit and 80% built" before the OPA was adopted; or,
- for facilities using sub-surface intakes to supply the augmented flow. But Poseidon is proposing expanding the production capacity – which increases the volume of wastewater and decreases the volume of dilution water.

With the expansion, Poseidon no longer has a "conditional permit" for the new design. It is an "expanded facility" as described in Section M.1.b(2).

Poseidon can continue using flow augmentation for the facility as it was conditionally approved in 2009. But they cannot use flow augmentation for an expanded facility – flow augmentation is not an allowed "alternative technology" for expanded facilities. And if they propose to use flow augmentation for the conditionally approved facility (ie, 50mgd production), they have to dilute the brine within a MAXIMUM of a 200 meter BMZ. **See M.3.d** below

The OPA definitions include:

Brine mixing zone (BMZ)

*The area where salinity may exceed 2.0 parts per thousand above natural background salinity, or the concentration of salinity approved as part of an alternative receiving water limitation. The standard brine mixing zone shall not exceed 100 meters (328 feet) laterally from the point(s) of discharge and throughout the water column. **An alternative brine mixing zone, if approved as described in the Ocean Plan chapter III.M.3.d, shall not exceed 200 meters (656 feet) laterally from the point(s) of discharge and throughout the water column. The brine mixing zone is an allocated impact zone where there may be toxic effects on marine life due to elevated salinity.** [emphasis added]*

Further, the Regional Board should be aware that the 100 meter BMZ was determined by analyzing the "near field" of brine dilution exiting a properly designed diffuser. The concern at the time was that improperly diluted brine could accumulate on the seafloor outside the BMZ (the "far field") and create ever-growing areas of hypoxic conditions.

Therefore, section III.M.3(d) states:

The owner or operator of a facility that has received a conditional Water Code section 13142.5(b) determination and is over 80 percent constructed by January 28, 2016 that proposes flow augmentation using a surface water intake may submit a proposal to the



*regional water board in consultation with the State Water Board staff for approval of an alternative brine mixing zone not to exceed 200 meters laterally from the discharge point and throughout the water column. The owner or operator of such a facility must demonstrate, in accordance with chapter III.M.2.d.(2)(c), **that the combination of the alternative brine mixing zone and flow augmentation using a surface water intake provide a comparable level of intake and mortality of all forms of marine life as the combination of the standard brine mixing zone and wastewater dilution if wastewater is available, or multiport diffusers if wastewater is unavailable.** In addition to the analysis of the effects required by chapter III.M.2.d.(2)(c), the owner or operator must also evaluate the individual and cumulative effects of the alternative brine mixing zone on the intake and mortality of all forms of marine life. **In no case may the discharge result in hypoxic conditions outside of the alternative brine mixing zone.** If an alternative brine mixing zone is approved, the alternative distance and the areal extent of the alternative brine mixing zone shall be used in lieu of the standard brine mixing zone for all purposes, including establishing an effluent limitation and a receiving water limitation for salinity, in chapter III.M. [emphasis added]*

The description of the brine flow in the Tentative Order states:

*[Based] on the model, the effluent discharge plume will be negatively buoyant (denser than seawater) and will flow along the ocean bottom downslope and off-shore towards the west-northwest. When the brine plume becomes stationary, at a distance of approximately **1,851 meters** from Discharge Point No. 001, the model predicts a difference in the salinity of the plume and the ambient ocean water to be less than 1 percent.... See Tentative Order at Attachment F-8*

This description of the brine plume sinking to the seafloor at the point of discharge and migrating offshore to 1851 meters and still not reaching ambient salinity is, ironically, the description of brine behavior that provided the rationale for requiring wastewater dilution or diffusers. The brine migrates to depressions where it is no longer exposed to currents and other mixing mechanisms, and accumulates into ever greater hypoxic zones inside and outside the BMZ.

The proposed facility is an “expanded facility” and is no longer a “conditionally approved facility with 80% construction completed” before adoption of the OPA. As such, the facility now must use wastewater for dilution, diffusers, or any alternative that meets the requirements in the OPA. But augmented flows for expanded facilities is strictly prohibited under section III.M.2(d)(2)

4. Mitigation Alternatives



Poseidon's conditional permit Marine Life Mitigation Plan (MLMP) used an ETM/APF calculation based on an 80% statistical confidence. After quite a bit of debate during the drafting process for the OPA, the required confidence level was increased to 95%. See III.M.2.e(1)(a) "[The] APF shall be calculated using a one-sided, upper 95 percent confidence bound for the 95th percentile of the APF distribution...."

Regardless of whether the proposed facility is considered an "expanded facility" or an update of the 2009 conditional permit, the Tentative Order must analyze the mitigation provisions in the OPA.

It is our understanding, in a very general way, that this change in statistical confidence would approximately double the acreage that was required in the 2009 conditional permit.

There are a number of other new considerations for mitigation in the OPA. It doesn't appear like the Tentative Order has adequately analyzed those new mitigation requirements and incorporated them into an updated MLMP.

Section III.M.2.e(3)(b)(viii) states:

For both in-kind and out-of-kind mitigation,* the regional water boards may increase the required mitigation ratio for any species and impacted natural habitat calculated in the Marine Life Mortality Report when appropriate to account for imprecisions associated with mitigation including, but not limited to, the likelihood of success, temporal delays in productivity, and the difficulty of restoring or establishing the desired productivity functions.*

For example: first, the MLMP must compensate for all area affected by brine above 2ppt. See M.3.e(1)(b). This additional area should include reasonably foreseeable brine accumulation spreading on the seafloor for the plant's operating life – as briefly mentioned above.

Second, it is our understanding that no restoration has begun. This delay must be calculated into the new MLMP. See M.3.e(3)(b)(viii).

These are just two examples of additional analyses of the MLMP that must be included before final adoption. The full requirements are found in III.M.

5. CONCLUSION

Had Poseidon applied for an expanded facility based only on the power plant discontinuing operation of their once-through cooling system, the analyses would have followed a path dictated for "conditionally approved facilities with 80% construction completed" prior to adoption of the Ocean Plan amendment for desalination. However, this application is for an



expanded facility based on the increased production capacity, increased volume of brine discharge, and reduced volume of dilution water. The analysis is more complicated.

To summarize, the Tentative Order must analyze:

- Whether a separate subsurface intake is feasible for the proposed total source water pumped into the production plant (127mgd), or a separate subsurface intake for only the additional source water for production (127-107= 20mgd);
- The expansion, based on the changes in design and operation, makes the distribution alternatives limited to three options: wastewater for dilution, diffusers, or an approved "alternative" technology. However, augmented flow for dilution is strictly prohibited for expanded facilities based on changes to "design or operation", and;
- The Marine Life Mitigation Plan must be revised to fully comply with the Ocean Plan amendment requirements.

Thank you for your consideration of our additional comments.

Sincerely,

A handwritten signature in black ink that reads "A. Sackett".

Mandy Sackett
Surfrider Foundation

Ray Heimstra

Ray Heimstra
Orange County Coastkeeper