**From:** kbiala@milestonemma.net
**Sent:** Tuesday, May 26, 2015 11:04 AM
**To:** MPWSP-EIR
**Subject:** Comments on EIR
**Attachments:** Biala Comments to CPUC on EIR.docx

Mr. Barnsdale, attached are my comments regarding the Desalination slant well EIR. My husband and I have been attending as many educational sessions as we can so that we may have further comments later as we learn more given this terribly short deadline comment period. By the way, we also sat through the entire 4.5 hours of CalAm presentation in Marina for the City Council and the Planning Commission! It is an incredible task for laypersons who live in the affected areas to understand this complex technical project in order for us to intelligently counter those who see this only as a business opportunity and have extraordinary dollars to purchase expertise and marketers. I hope you can appreciate our challenges.

Cordially,
Kathy Biala

P.S. Please confirm receipt of my comments if you will. Just in case, I am also sending a hard copy to your office. Thank you.

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Desalination EIR Comments by Kathy and Harvey Biala

Important points arising out of Dr. Carol Reeb's presentation at the Monterey Unitarian Universalist Church 5/19/15 with relevance to the CalAm desalination project as summarized by Kathy Biala, resident of Marina.

Dr. Reeb from Stanford University presented technical issues related to desalination plants in such a clear manner that a layperson such as myself could understand even complex concepts. She is to be commended for her community contributions on this subject of great import to us.

**1.** Waste water from our three current small Monterey County desalination plants comprise only 1% of the wastewater that will be produced by the proposed CalAm slant well in Marina. This slant well will create 40-50 million gallons of wastewater per day…most being discharged to the current sewer system. **Can our current sewer system, in the short and long term, sustain such a huge volume of additional wastewater?**

**2.** Current coil membranes used for reverse osmosis desalination have been deemed "safe" against pathogens, pharmaceuticals, and most common contaminants in seawater (boron), mercury, etc. IF incoming source water is monitored and appropriately treated and the facility is adequately maintained AND IF the water is filtered 1 ½ to 2 times to remove boron**. Is the maintenance plan in place and accounted for in the cost of the project long term? How does this maintenance plan compare to other plants?**

Here is a link to the World Health Organization's document on safe drinking water from desalination. For boron, go to pg 5, Section 4:
http://www.who.int/water_sanitation_health/publications/2011/desalination_guidance_en.pdf

**3.** Brine is a waste byproduct of the desalination process. It has a high concentration of salt and therefore is denser, and if not properly diluted and mixed, it will sink to the bottom of the ocean floor where it can accumulate and persist through time. Brine accumulating on the seafloor can also create hypoxia, whereby oxygen is depleted beneath the brine layer. This is deadly to marine life.

As is often said by the experts, "Solution to pollution is dilution". On the seafloor, there is very little energy to mix brine. Most of the energy for mixing in the ocean occurs at the surface with the wind and waves, not on the seafloor. If a desalination plant uses an offshore sewer outflow, it has been determined that a high pressure discharge pump can disperse and dilute the brine in the ocean better than low pressure (velocity) discharges. In fact, the new regulatory policies adopted by the State Water Resources Control Board encourage high velocity (pressure) diffuser modifications on discharge outflows when there is inadequate wastewater to dilute the brine. Using high velocity diffusers will allow brine to be significantly diluted.

**Is such a pressure diffuser pump being considered and if not, how can we ensure that this will be part of the mitigation plan?**

**4.** Since brine returned to the ocean has the potential to layer on the seafloor and persist over time in the outflow area, monitoring of salinity and dissolved oxygen are critical steps. There are many ways marine scientists can monitor the outflow area: take direct samples, use of sonar to gauge water density, or use aquatic submersible "drones" to patrol and measure water quality parameters (oxygen and salinity). In addition, there are many research studies currently underway in which electronic tags housing salinity meters have been deployed on fish and marine mammals in Monterey Bay. These tags record and relay water quality data to the lab for analysis. Over time, any change in water quality in regions where tagged animals swim will be detected and reported. **What are the current proposed monitors for ocean salinity and the monitoring schedules?**

**5.** Brine layers act as a "plastic saran wrap" and cut off oxygen exchange with the upper water column. As a result, respiration by bacteria and other organisms beneath the brine layer will quickly deplete the water of oxygen and cause animals on the seafloor to essentially suffocate. In addition, when marine life is exposed to these denser layers of salt water, animals will begin to dehydrate – embryos and eggs of marine species are especially vulnerable, as are marine invertebrates like squid, mollusks, sand dollars, and others. This is because water within the cells of animals is drawn from their bodies into the saltier sea around them – in other words, in the brine, animals start to dehydrate. Dr. Reeb's lab has shown that squid embryos have less resiliency in slightly elevated concentrations of salt water. Because the California market squid uses the seafloor for its egg nurseries, brine discharge into these nurseries could negatively affect squid populations over the long-term. If these effects are severe enough, there could not only be economic impacts to the squid industry, but there might be ecologic affects to the food chain because squid are an important food source for a multitude of species of marine life, including endangered species like steelhead trout. **There is no mention of the impact to squid in the EIR, except quoting a 1998 study that showed "no squids" in the study area. The EIR did not include a more recent survey of marine life inhabiting the proposed brine outflow area. The EIR must have a thorough study of the food chain and the impact of squid in the project areas.**

**6.** It has been shown that Red Tides are a recurring phenomenon in Monterey Bay. These harmful algal blooms (HABs) occur when colonies of algae grow out of control. Sometimes, they produce harmful toxins that can accumulate in seafood (fish, shellfish). These toxins can harm marine mammals, birds, and people too (NOAA).

Here is a link for HABs in the Marine Sanctuary:
http://coastalscience.noaa.gov/news/coastal-pollution/monterey-bay-national-marine-sanctuary-seeks-advice-harmful-algal-bloom-threat/

The EIR does include this impact. This is why subsurface wells are a benefit to the CalAm plant design because they can mitigate the effects of algal blooms much more successfully than open ocean intakes used in other desalination plant designs currently proposed for Monterey Bay. Large, persistent Red Tides have been shown to clog the intake pipes in desalination plants even for as long as 8 months as in one desal plant in Saudi Arabia; there is also the issue of algal blooms that can harbor cyanobacteria. In our area, Red Tides are absolutely present in Monterey Bay. Fortunately, the EIR proposed to use subsurface (slant wells) to mitigate the affects of Red Tides**. <u>However, if these slant wells are found to be "not feasible," for example because of cost, then the EIR does not mention how algal toxins will be mitigated if CalAm needs to use open ocean intakes instead. Will there be another opportunity for additional EIR considerations if direct ocean intake is considered?</u>**

*NOTE: According to Dr. Reeb, as long as CalAm uses subsurface wells, they should have little problem with Red Tides. It is only if these wells are considered too expensive or not feasible that there would be the need to add more information to the EIR that would mitigate clogs and toxins.*

**7.** With the currently 21 proposed desalination plants in California, only 1.2 % of our current water needs can be met via these plants. Once built, for whatever reasons, plants should not be "turned off" as it is tremendously expensive to restart the system (rebooting costs one-third of original costs to build the plant).

*NOTE: Dr. Reeb reports that in the case of Santa Barbara, a desalination plant was built about 20 years ago. Because it started raining shortly thereafter, the facility was never used. Eventually, they gutted the valuable parts and sold them. Now those parts must be replaced. The cost is around $40M. If Reverse Osmosis facilities are not used regularly, the components will become "fouled," clogged and will need to be replaced. These plants cannot simply be turned on and off as needed. Once on, they should stay on. Otherwise, there will be the cost of replacing the filtration components, which can be expensive.*

**We must fully debate the taxpayer burdens committed to one very expensive water method over commitments to several less costly methods that can be used simultaneously (diversification). Can we not consider the impact of ALL planned water system projects and the contributions of the desal plant as one of several operating initiatives?**

**8.** If there is 24.1 million gallons of ocean water taken in, 9.5 M gallons can become potable (drinking) water, 14.6 M gallons will be brine that must be safely dispersed or distributed. These are not good proportions, by any means! In addition, 40% of the cost of desalination is for electricity to run the plants. Desalination is not a clear

cut, "final" solution to the water shortage. Dr. Reeb recommends a diversity of methods that can generate reliable availability of continuous potable water.

*NOTE: According to Dr. Reeb, a diversified water portfolio includes: Wastewater and stormwater recycling and purification (using reverse osmosis desalination technologies – which require 1/3 less than seawater desalination); Aquifer storage and recovery, grey water recycling, and of course, more conservation (do we need lawns and water features?). Seawater desalination should be a supplement to our water supply; it should be used as a last resort.*

**Does CalAm have a full understanding of the other system water sources and are plans in place to connect and collaborate for the greater water needs of our local communities, rather than propose a single project that in and of itself cannot guarantee uninterrupted or continual adequacy of potable water supplies?**

**9.** Currently available technologies must be developed, tested, and adopted to current desalination methodologies e.g. adding forward osmosis component to reverse osmosis plant to create a hybrid facility; or including electrodialysis or using the newer graphene (nanoporous single-layer) membranes, which can use less energy. We need serious focus on science not just on business enterprises.

**What role does our community/CalAm/university/public officials have in ensuring that we continue to invest in research and development for future improvements so that this new slant well technology evolves and can be viable for our long term future?**

**10.** Issue of what to do with resultant brine is a critical problem. The CalAm project will rely on using our current sewage systems or following the recommendations of the State Water Board, diluting the brine with waste water; BUT waste water is currently being used to irrigate farming fields, especially in the summer. **Will there be enough unused wastewater to dilute the brine?**

Furthermore, converting wastewater to potable water uses only one third the amount of electricity it would take to dilute brine water to an acceptable level to put it back into the ocean. Does it make sense to choose dilution of brine with wastewater when purifying wastewater is a more efficient way to create potable water? **What alternatives are in place for unavailability of adequate volume of wastewater for brine dilution? Are there any current plans to convert more wastewater to potable water?**

We need to be firm on the stance that no brine should be dumped back into the ocean undiluted and/or without adequate outflow distribution methods. This has a real potential to alter our marine eco-system in ways we cannot fully imagine now. If we invest heavily in seawater desalination, we must do it right. **Is there an**

**absolute guarantee in the proposal, that no brine will be dumped back into the ocean undiluted and/or without adequate distribution methods?**

**11.** In the future, we should find ways, and perhaps develop research funding to recover salt from the brine, harvest minerals/metals present in brine, and/or producing energy/electricity from brine. All this may be possible if we are committed to research and development and are committed to developing ocean-friendly seawater desalination for the future. **Is there added funding allocated and/or any efforts aimed at promoting allied technologies/methodologies for continued research and development connected to the current slant well project?**

**12.** The EIR presented by CalAm did not include the results from the slant well pilot (only in operation 20 days at the time of the EIR presentation). This appears to be a rather brief testing period by any scientific study standards. Any timetable of approvals must be delayed until the EIR is properly documented with public comment. **What do the scientists say is a proper amount of "test time" for a pilot slant well (Dana Point ran for 2 years) given the unique geographies and marine life at each location?**

**13.** Note: This comment is separate from Dr. Reeb's presentation and expresses an additional concern of Kathy Biala. The EIR sections 4.6-2 (Result in substantial adverse effects on riparian habitat, critical habitat, or sensitive natural communities during construction) is labeled LSM (less than significant impact with mitigation). Among the mitigation actions listed is providing a lead biologist who "oversees implementation of protective measures". This would be a very key person to protect the interests of our community. **How will this biologist be chosen? Who will pay the salary? If CalAm pays the salary for this position, what are the safeguards for conflict of interest, transparency, and accountability? Can this position report to a responsible public board as opposed to reporting to a CalAm employee? Does this position have only data reporting capabilities or will this position have direct authority to stop or revise operations that are out of compliance? Who will write the plan/standards for "protective measures" that this position will "oversee"?**

Thank you for considering our concerns about the slant well desalination project and its corresponding EIR.

May 25, 2015
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