

Proposed Amendment to the Ocean  
Water Quality Control Plan for  
**Desalination Intakes  
and Brine Disposal**

*Maria de la Paz Carpio-Obeso, PhD  
California Environmental Protection Agency*



Monterey Bay National Marine Sanctuary  
SAC Meeting  
Dec 12, 2013



# Statewide Proposed Desalination Facilities

1. East Bay MUD
2. CA Water Service Company
3. City of Santa Cruz
4. DeepWater, LLC
5. Regional Desal Project
6. Cal Am
7. Ocean View Plaza
8. Monterey Peninsula WMD
9. Monterey Bay Seawater Desal Vessel
10. Cambria Community Services District
11. Oceano Community Services District
12. West Basin MWD
13. Poseidon Resorces, Huntington Beach
14. South Coast Water District
15. City of Oceanside
16. Poseidon Resorces, Carlsbad
17. San Diego County Water Authority



## Legend

- Proposed Desalination Facilities
- Enclosed Bays And Estuaries
  - Areas of Special Biological Significance (ASBS)
  - Marine Protected Area (MPA)
  - National Marine Sactuary (NMS)
  - Regional Board Boundary
  - County Boundary
- Capacity (MGD)
- 0 - 10
  - 10 - 25
  - 25 - 50
- 3nmLimit



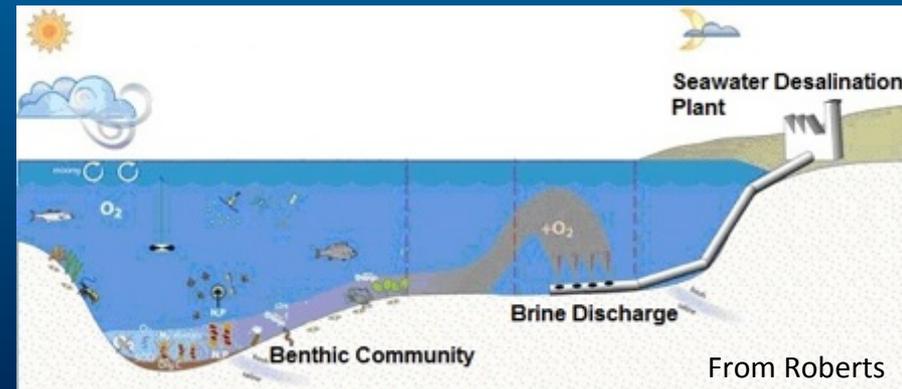
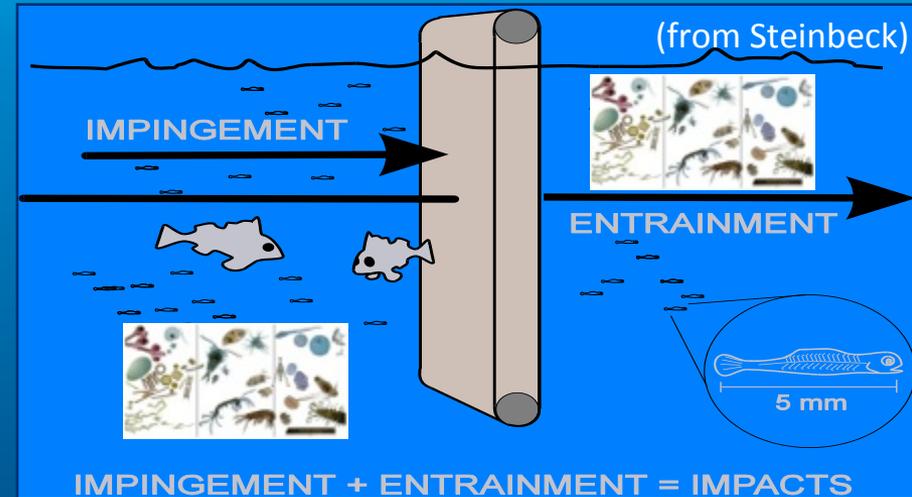
# Why is a new regulation needed?

Many new desalination projects have been proposed along the CA coast to alleviate water shortages.

# Potential Impacts from Desalination Facilities

**Intakes:** Withdrawal of ocean or estuarine water will entrain and/or impinge aquatic life.

**Discharge:** Brine wastes discharged into the ocean may form a dense plume that settles on the ocean floor, harming benthic marine life.

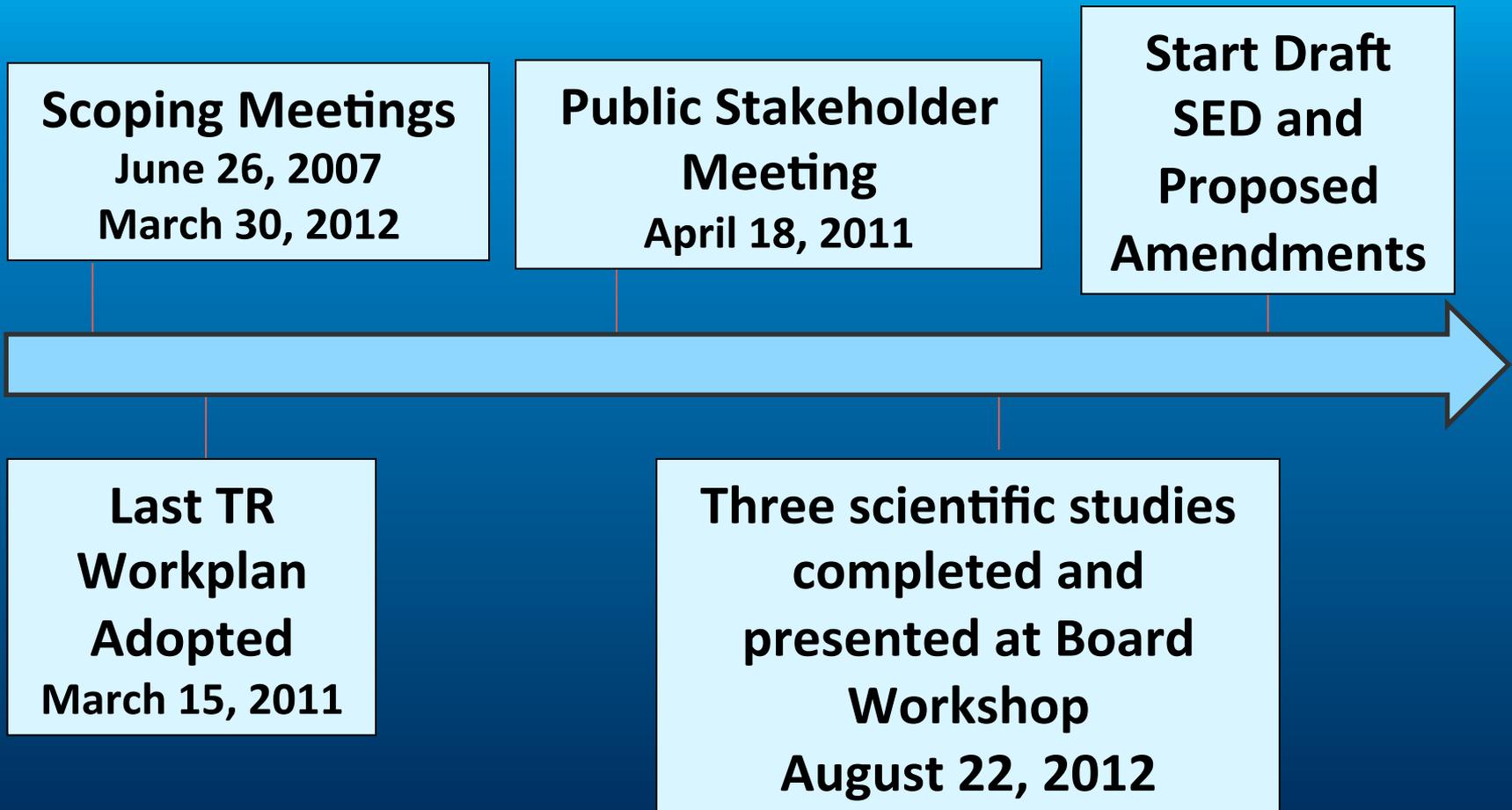


# Current Regulations

- The California Ocean Plan does not address intakes or brines discharges from desalination facilities.
- Desalination facilities are currently regulated under the NDPES permits by Regional Boards on a project-specific basis.

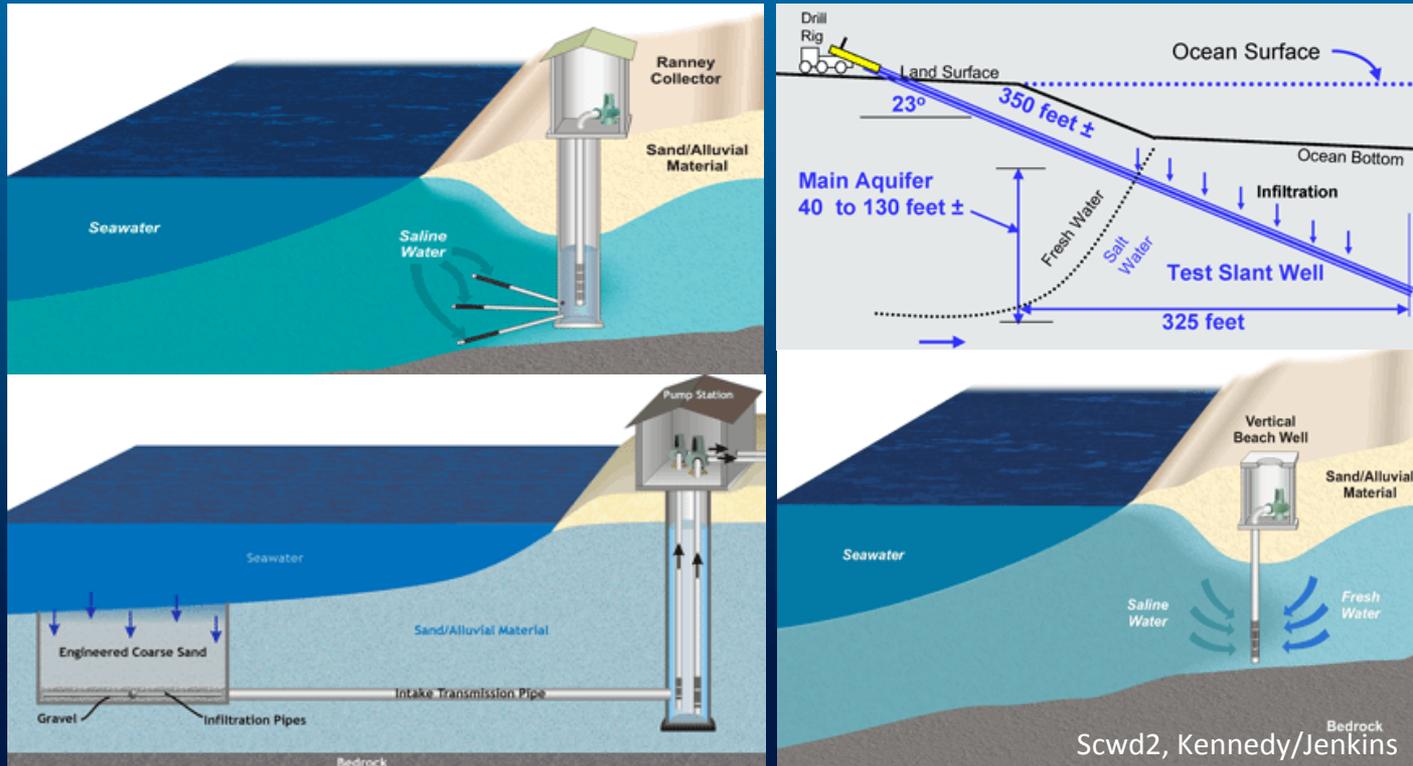


# Previous Steps



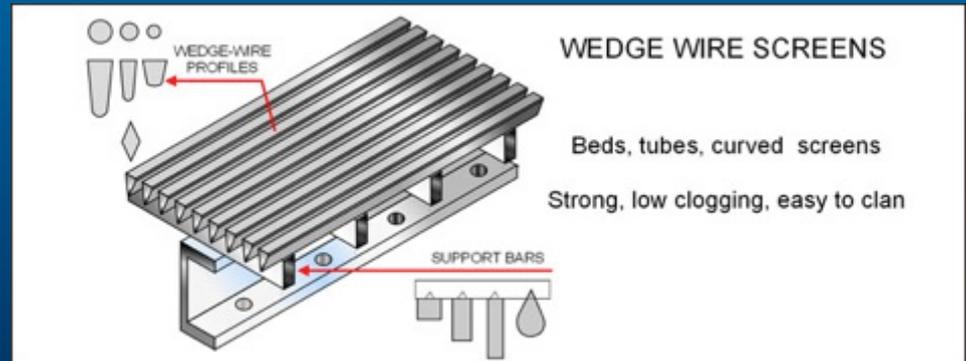
# ERP Recommendations - Intakes

- Track 1- Subsurface ( below ground seabed)
  - Wells –brackish or saline groundwater
  - Below substrate- infiltration galleries



# ERP Recommendations - Intakes

- Track 2- Surface water
  - Limit intake velocity to 0.5 ft/s (15 cm/s)
  - Use of fine Screens



# Recommendations on Intake Impacts and Mitigation

How should any remaining IM&E be mitigated after the best site, design and technology are determined for a new desalination plant intake?

- A fee, based on Area of Production Foregone, could be used to fund mitigation for entrainment losses



Source: Tetra Environmental

# Recommendations – Process and Mitigation

**Process :** Best site and design for a new facility to be determined by the Water Boards following a collaborative process with other state agencies involved in facility permitting.

**Mitigation:** For residual impacts after intake controls, mitigation based on Area of Production Foregone, determined using Empirical Transport Model.

# Potential Discharge Impacts

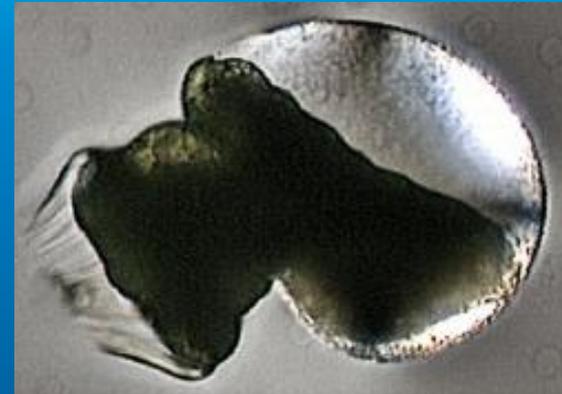
- The effects of exposing benthic marine life to a dense, highly saline plume are not very well understood.
- Granite Canyon Brine Toxicity Study investigated sensitivity of red abalone, purple urchin, sand dollars, mussels, mysid shrimp, giant kelp and topsmelt to elevated salinity



# Potential Discharge Impacts

## Granite Canyon Brine Toxicity Study Results:

- Invertebrates are sensitive to elevated salinity.
- Red abalone were most sensitive (observed effect at ~5% above 'average' seawater).
- Implications for endangered black abalone?



# Brine Panel Recommendations on Brine Fate and Disposal

- A salinity increase of no more than **5 percent (2 ppt)** in the receiving waters around the discharge appears protective to biota.
- Monitoring programs should be required for all discharges (effluent and receiving environment).
- The use of multiport diffusers for discharging undiluted brine

# Project Status

## Interagency Meetings

April 24, 2012  
March 12, 2013  
May 22, 2013  
August 6, 2013

## Targeted Stakeholder Meetings-2013

June 12- Costa Mesa  
June 17- San Francisco  
June 21-Santa Monica  
June 27-Santa Cruz

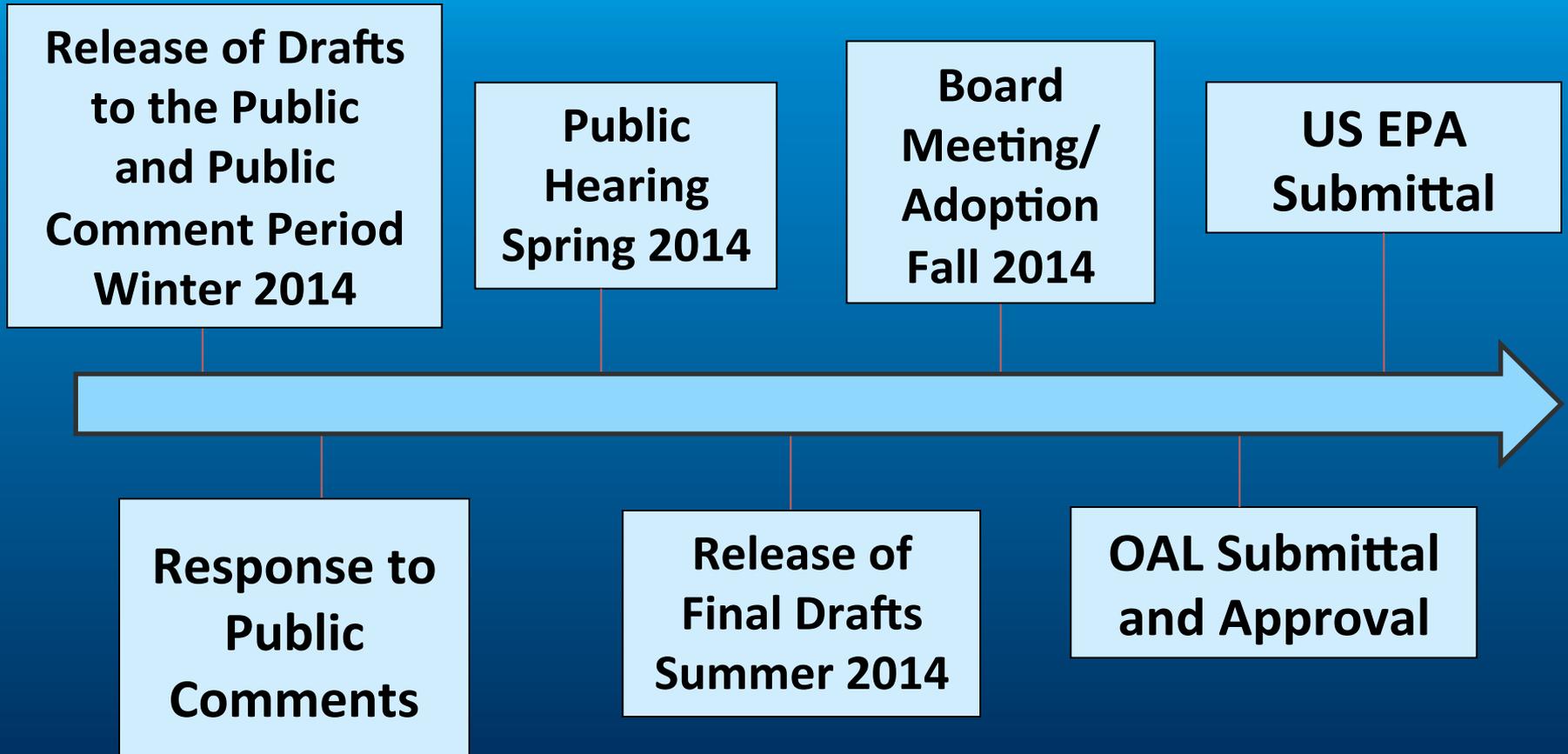
Internal Review of Draft SED and Amendments

Stakeholder Meeting  
Jan 30, 2013

Reconvene Intake Panel  
April, 2013

Desal Workshop with Expert Review Panel  
Sept 23, 2013  
Final Report Oct, 2013

# Next Steps



# Contact Information

**Maria de la Paz Carpio-Obeso, Ph.D**

Ocean Unit Chief

MarielaPaz. Carpio-

Obeso@waterboards.ca.gov

(916) 341-5858

