Implementing California's Performance Standards for the Discharge of Ballast Water

Nicole Dobroski

Marine Invasive Species Program
California State Lands Commission

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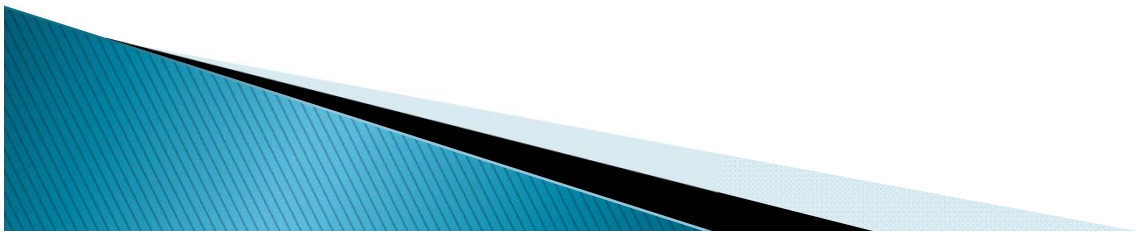
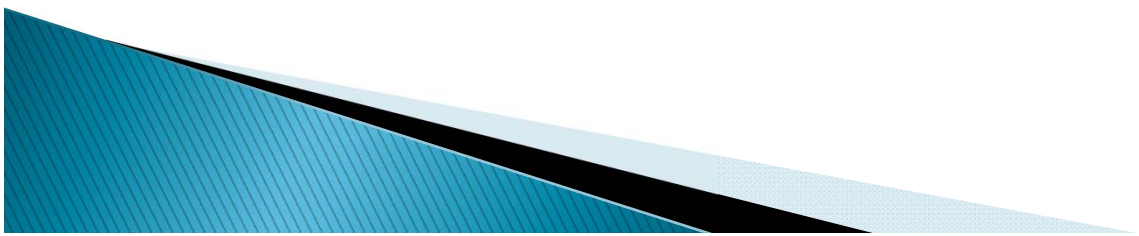
History

- 2003 Marine Invasive Species Act
  - Mandate to develop and recommend standards
- 2005 Technical Advisory Group meetings
- 2006 Performance standards report to legislature
- 2006 Coastal Ecosystems Protection Act
  - Standards and implementation schedule set in statute
- 2007 Regulations adopted

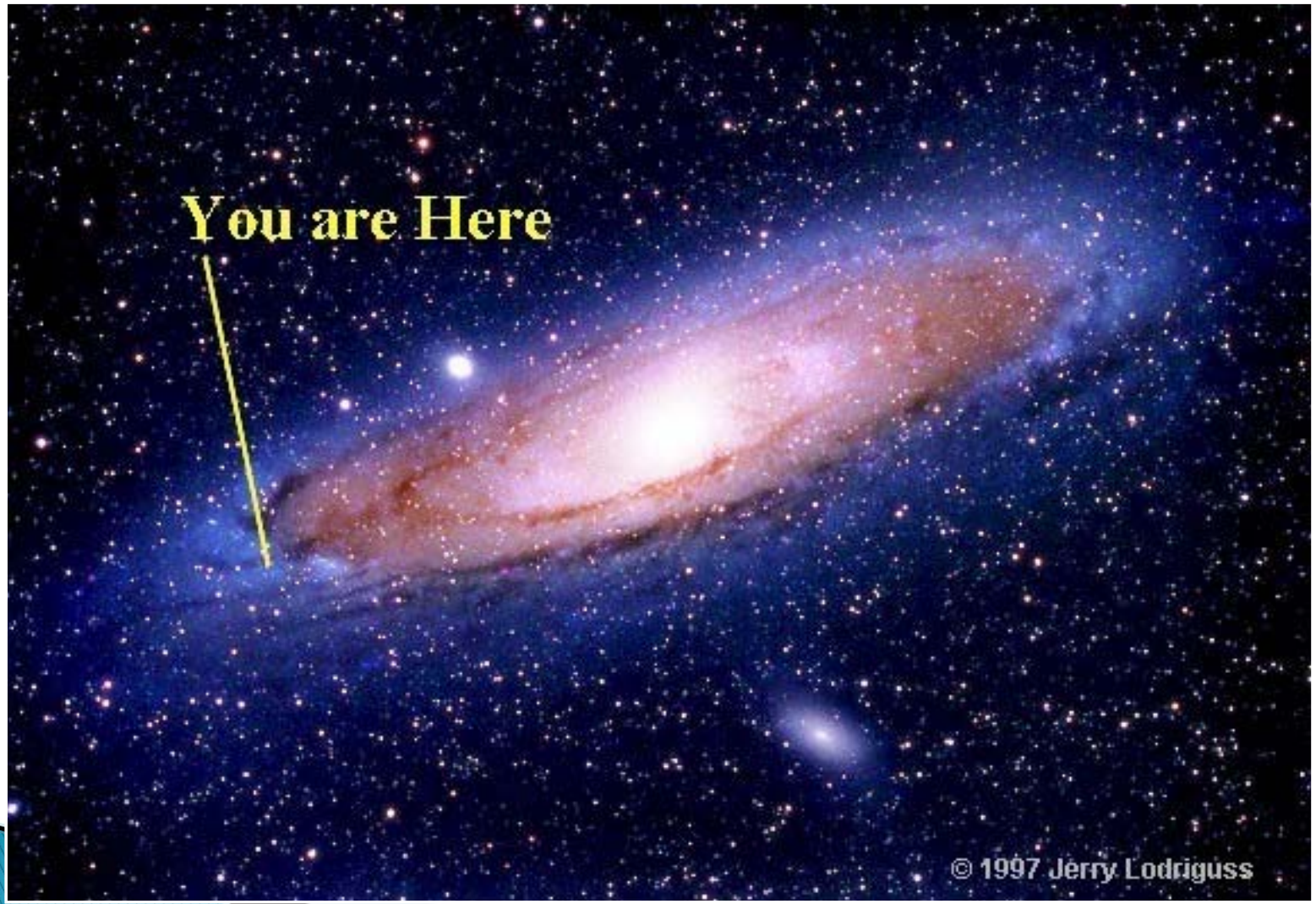


History (continued)

- Reports to legislature assessing available treatment technologies
  - 2007 No technologies available, delay implementation new builds $\leq$ 5000 MT from 2009 to 2010
    - S.B. 1781 (2008)
  - 2009 Systems demonstrate "potential" to meet standards, continue with implementation
  - 2010 Systems demonstrate "potential" to meet standards, continue with implementation
  - 2013 No technologies available to meet all of CA performance standards, delay implementation for two years
    - S.B. 814 (2013)



Where are we now?



Performance Standards

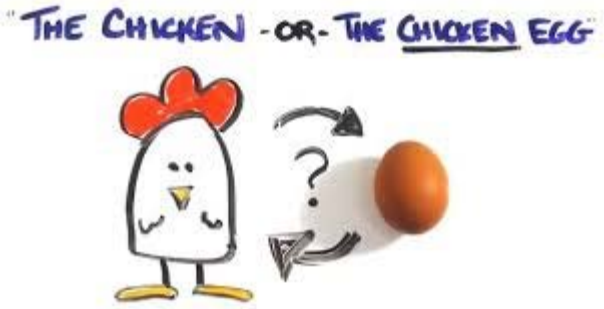
Organism Size Class	California	IMO Regulation D-2/ U.S. Federal
Organisms greater than 50 µm in minimum dimension	No detectable living organisms	< 10 viable organisms per cubic meter
Organisms 10 – 50 µm in minimum dimension	< 0.01 living organisms per ml	< 10 viable organisms per ml
Living organisms less than 10 µm in minimum dimension	< 10^3 bacteria/100 ml < 10^4 viruses/100 ml	
Escherichia coli	< 126 cfu/100 ml	< 250 cfu/100 ml
Intestinal enterococci	< 33 cfu/100 ml	< 100 cfu/100 ml
Toxicogenic *Vibrio cholerae* (O1 & O139)	< 1cfu/100 ml or < 1cfu/gram wet weight zoological samples	< 1 cfu/100 ml or < 1 cfu/gram wet weight zooplankton samples

Implementation Schedule

Ballast Water Capacity of Vessel	Standards apply to new vessels in this size class constructed on or after	Standards apply to all other vessels in this size class beginning in
< 1500 metric tons	~~2009~~ ~~2010~~ **2016**	~~2016~~ **2018**
1500 – 5000 metric tons	~~2009~~ ~~2010~~ **2016**	~~2014~~ **2016**
> 5000 metric tons	~~2012~~ **2016**	~~2016~~ **2018**

Challenges

- No USCG type approved systems available
  - CA does not require use of USCG type approved systems, but…
- Type approval testing (USCG, IMO) does not address CA standards
- Limits of detection/methods for select standards
  - 10-50, total living bacteria, total living viruses
- Absence compliance assessment protocols
  - Chicken and egg situation remains



Marine Invasive Species Act Mandate

- "…move the state expeditiously toward the elimination of the discharge of nonindigenous species into the waters of the state…, based on the best available technology economically achievable."

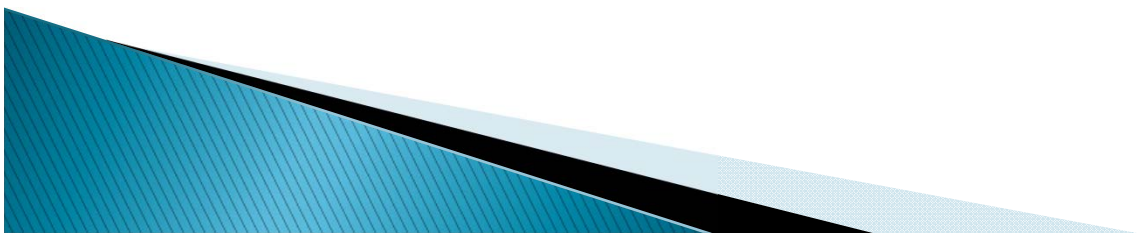
Alternatives to Exchange

- Application for use of experimental treatment systems
  - Provides 5-year equivalency to CA standards
  - STEP
- Use of USCG AMS in California waters
- Potable water

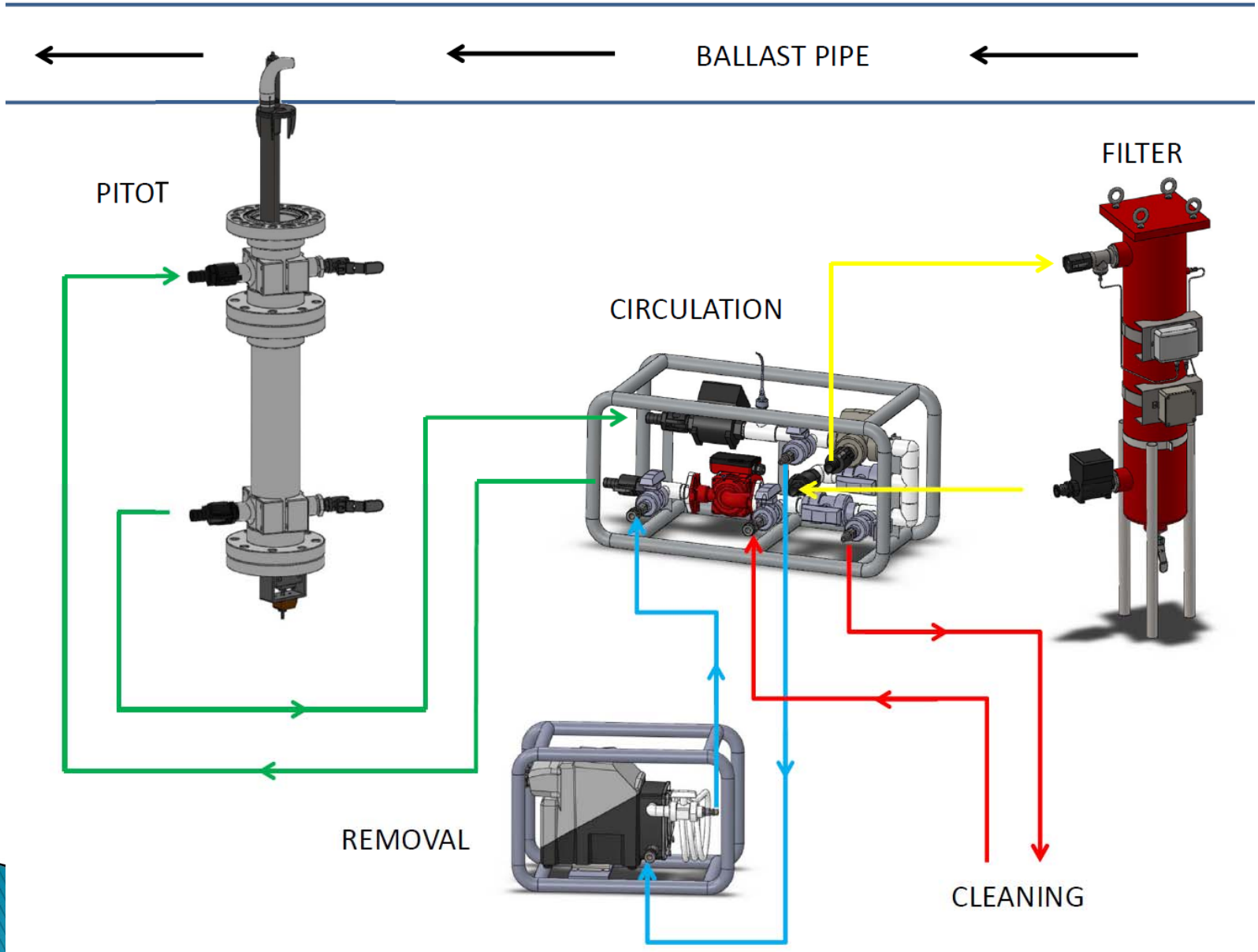
- Retention remains most protective strategy
  - 85% arrivals to CA waters retain all ballast
  - However, all vessels still pose biofouling risk

Funded Research

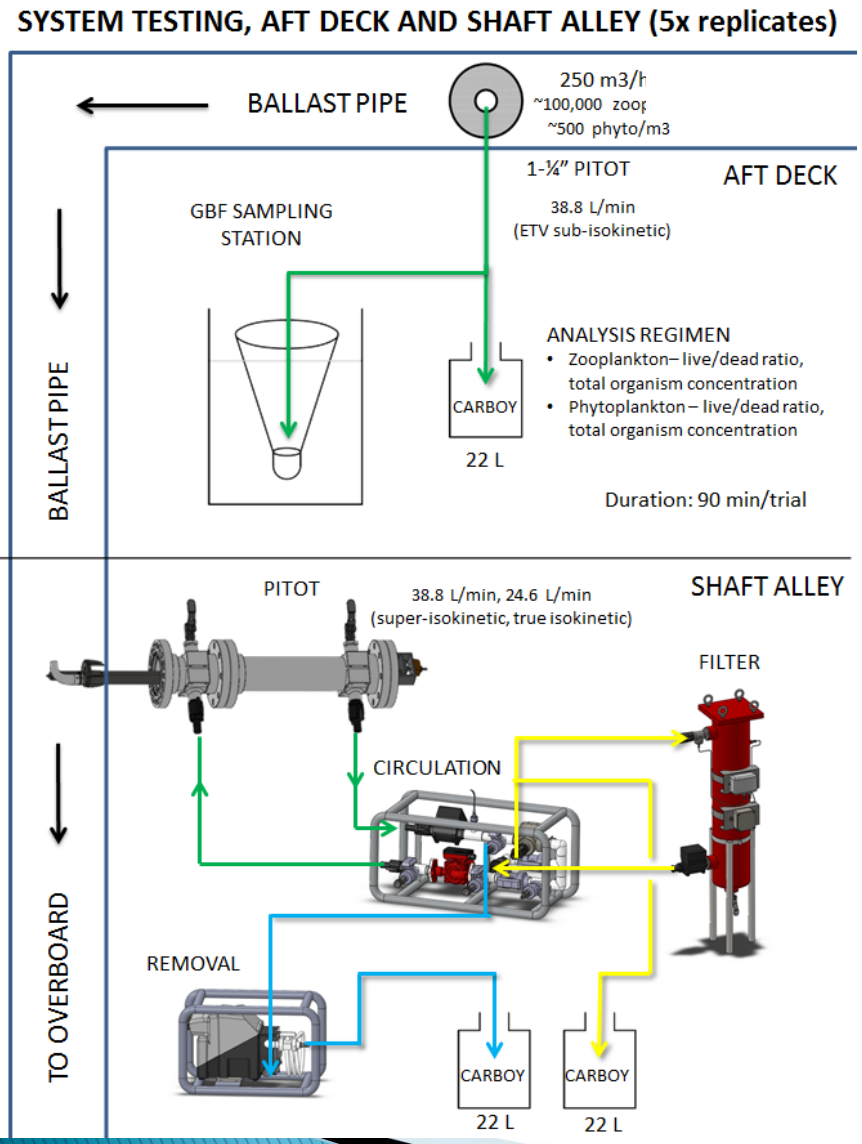
- Ballast water compliance monitoring and sampling system
  - The Glosten Associates
- FDA bulk assay
  - Dr. Nick Welschmeyer, Moss Landing Marine Laboratories
- Shore-based treatment feasibility study
  - RFP available mid-March

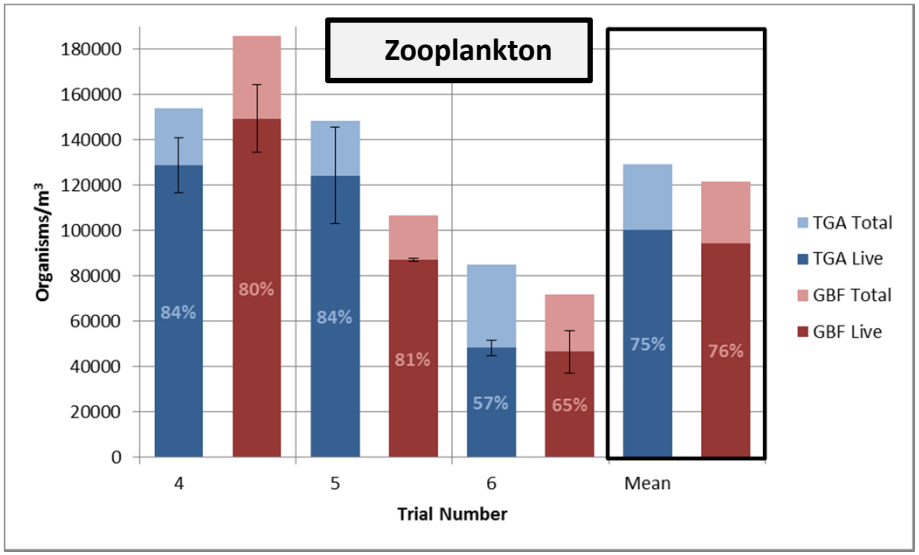


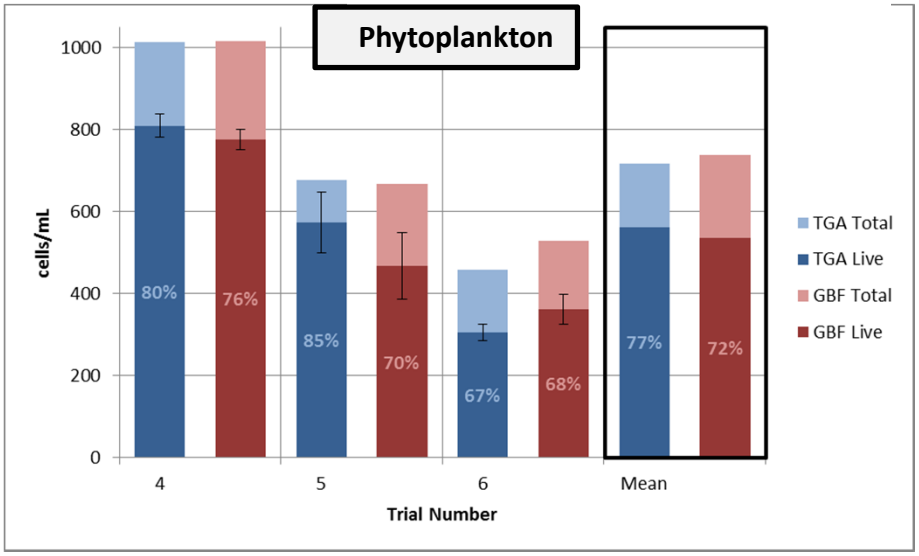
Compliance Monitoring and Sampling System



System Testing at Golden Bear Facility







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Moving Forward

- The “best available technology economically achievable” could apply to both BWTS and compliance methods.

- NPDES permits may contain discharge limits below the limits of available detection technologies
  - Dischargers that can reach “no-detectable” using best available technology in compliance with limit in permit

- Could this approach work to implement California standards?

Next steps

- Next treatment technology assessment report due July 1, 2014
  - Receive direction from State Lands Commission
    - It's an election year…
- Research compliance assessment methods
  - ETV as guide for methods of analysis
  - Novel techniques?
    - Limits of detection
- Results from shore-based feasibility study

- Food for thought
  - 2020 "Final Standard" – no detectable living organisms for all organism size classes
    - Weaker than interim standards?

- One step forward, two steps back
  - Patience is a virtue


Questions?
For more information:
nicole.dobroski@slc.ca.gov
www.slc.ca.gov