

Public Water Agencies:

Alameda County Water District

Alameda County Flood Control
and Water Conservation District, Zone 7

Contra Costa Water District

Kern County Water Agency

Metropolitan Water District of Southern California

State Water Contractors

San Luis & Delta-Mendota Water Authority

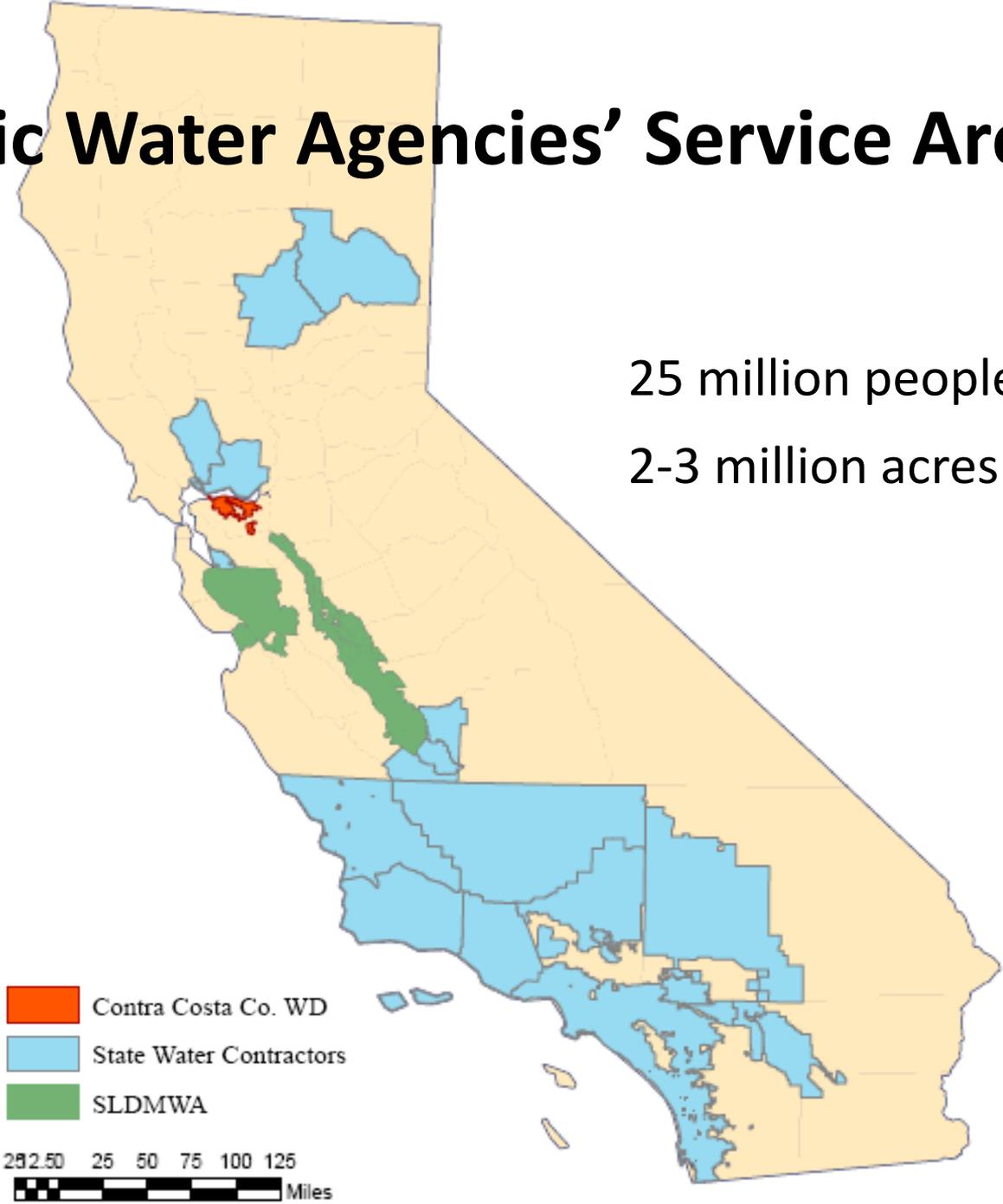
Santa Clara Valley Water District

Westlands Water District

State Water Resources Control Board Meeting
July 18, 2012

Public Water Agencies' Service Areas

25 million people
2-3 million acres farmland



The State Board has a Profound Interest in these Proceedings

- The SRWTP is impacting health of entire Bay/Delta ecosystem
- State Board's Flow Criteria Report recognizes the pressure to allocate more fresh water to protect public trust resources from "other stressors" like SRWTP's discharge
- The continued impacts from these "other stressors" is greatly taxing the State's limited water resources
 - See, e.g., Water Quality Control Plan proceedings for Bay/Delta

Your Flow Criteria Report Provides Critical Context for this Proceeding

- “Best available science supports that it is important to directly address the negative effects of other stressors, including habitat, water quality, and invasive species, that contribute to higher demands for water to protect public trust resources.”
- “The flow improvements that the State Water Board identifies in this report as being necessary to protect public trust resources illustrate the importance of addressing the negative effects of these other stressors that contribute to higher than necessary demands for water to provide resource protection.”
- “Future habitat improvements or changes in nutrients and contaminants, for example, may change the response of fishes to flow. Addressing other stressors directly will be necessary to assure protection of public trust resources and could change the demands for water to provide resource protection in the future.”

Draft Order and NPDES Permit

Appropriately Recognize:

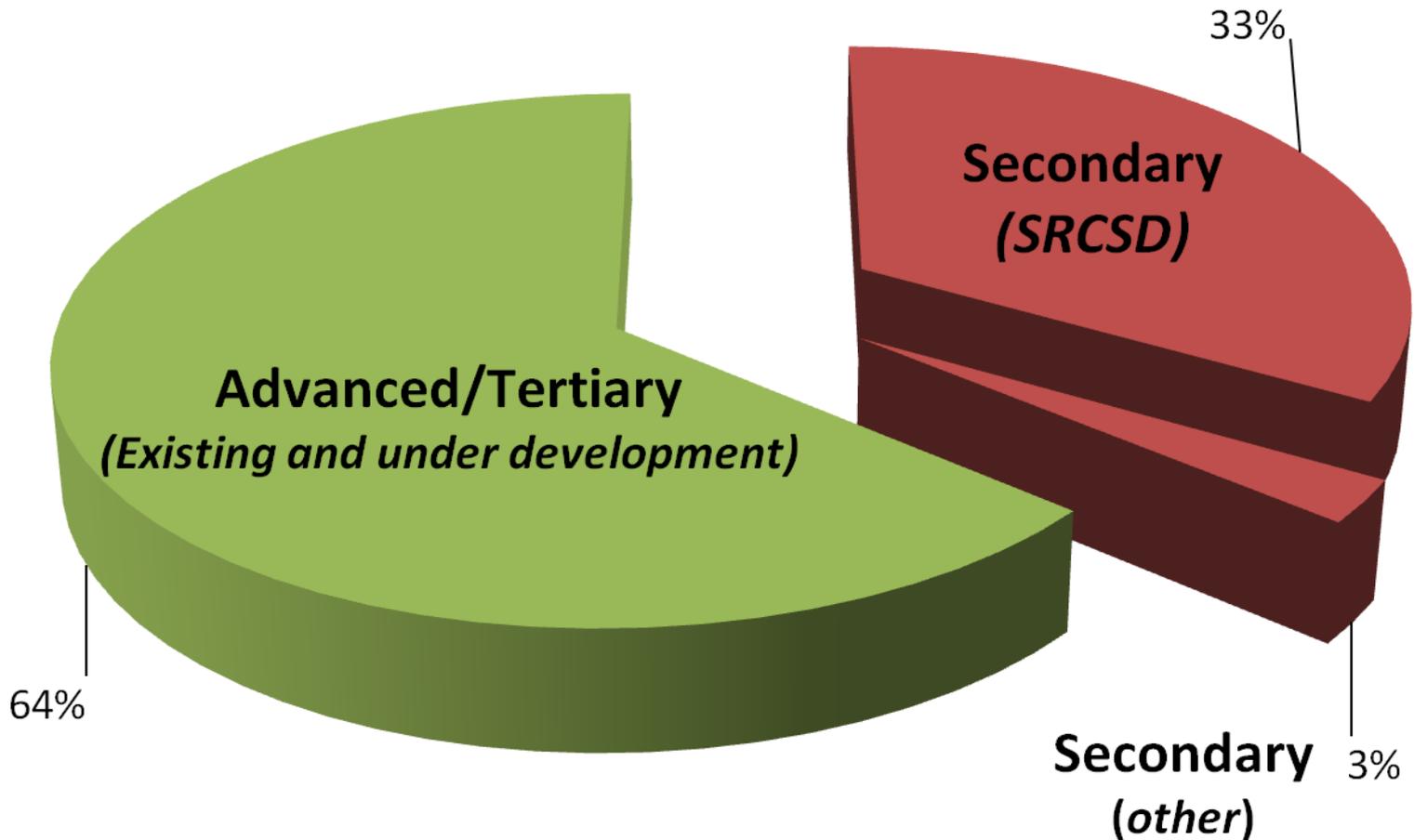
- Ammonia causing widespread ecological damage
- Nitrogen needs to be reduced to control nutrient enrichment and eliminate nuisance conditions
- Pathogens in region's dominant wastewater discharge need to be reduced

But We Have Five Important Requests:

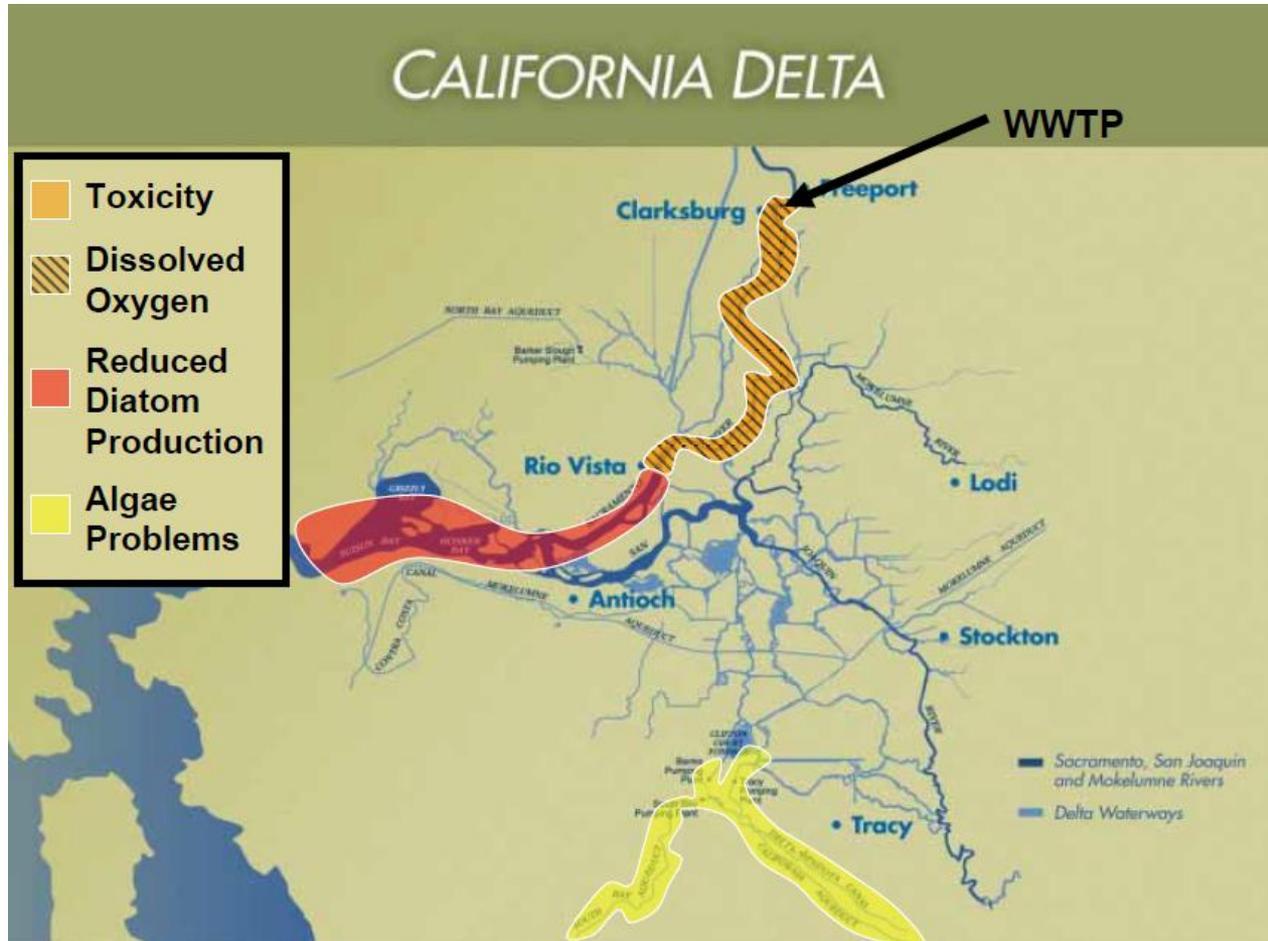
Point	Request
2020 too long to wait for SRWTP upgrades; no significant upgrades since SRWTP brought online in 1982	Materially shorten compliance schedule
SRCSO not planning any meaningful interim measures	Direct Regional Board to set reduced interim limits and require feasible interim measures
Permit's nitrate limit enjoys ample justification	Uphold Regional Board's 10 mg/L nitrate limit
Waste heat of SRWTP adversely affecting listed species and critical habitat	Eliminate unlawful exception to Thermal Plan
Permit limits supported by ample legal authorities and independent lines of evidence not stressed in draft order	Revise draft order to emphasize these legal authorities and independent lines of evidence

The Time has Come to Bring the Region's Largest POTW in Line with BPTC for this Region:

(Permitted Flow of All Central Valley Basin WWTPs)



The Massive Footprint of Impacts from SRWTP Can No Longer be Tolerated



SRWTP out of Step with the Major POTW on Chesapeake Bay/Potomac River System

Sacramento Regional WWTP



- Largest estuary on the west coast
- Rich ecosystem supports multiple ecological and societal uses

- Largest POTW in watershed
- 181 mgd, serves 1.3 million

- Only major WWTP in watershed without advanced treatment

Blue Plains WWTP



- Largest estuary on the east coast
- Rich ecosystem supports multiple ecological and societal uses

- Largest POTW in watershed
- 370 mgd, serves 2.0 million

- Began nutrient reduction in 1996
- Tertiary filtration completed in 2007

Draft Order Properly Affirms Ammonia Limit

- Affirms Regional Board appropriately denied mixing zone for ammonia
- Affirms the Regional Board use of scientific literature to justify ammonia limit
 - Ammonia is inhibiting nitrogen uptake by diatoms
 - Ammonia is causing toxicity to copepods, compromising integrity of entire water body
- Multiple independent lines of scientific evidence—including peer reviewed, published literature—demonstrate that ambient ammonia levels miles downstream exceed protective levels many times over

Organism	NH ₄ Effect	Effect Level NH ₄ (mg N/L)	Exceedance Factor								Reference
			End of Pipe		60 feet below diffuser		R3 - 4,200 feet below diffuser		Hood - 8 miles downstream		
			Max	Mean	95%	Mean	Max	Mean	Max	Mean	
Ambient NH ₄ (mg N/L)			45	22.3	5.46 ¹	2.1 ¹	1.5	0.4	0.71	0.46	RWQCB dataset; Foe <i>et al</i> 2010
<i>P. forbesi</i>	Reduce Reproduction and nauplii survival	0.36	125X	62X	15X	6X	4X	1.1X	2X	1.3X	Dr. Swee Teh
Diatoms	Reduces nitrate uptake	0.014	3,214X	1593X	390X	151X	107X	29X	51X	33X	Dugdale <i>et al</i> 2007; Wilkerson <i>et al</i> 2006
Diatoms	Shuts down nitrate uptake	0.056	804X	398X	98X	38X	27X	7X	13X	8X	Dugdale <i>et al</i> 2007; Wilkerson <i>et al</i> 2006
Delta smelt	Acute Toxicity (96-Hr LC50)	11.8	4X	2X	0	0	0	0	0	0	Werner <i>et al</i> 2010
Delta smelt	Chronic Toxicity	0.56	80X	40X	10X	4X	3X	0	1.3X	0	LC50/ACR of 21
Aquatic Life	Acute Toxicity	5.62	8X	4X	1X	0	0	0	0	0	1999 EPA Ammonia Criteria
Aquatic Life	Chronic Toxicity	1.45	31X	15X	4X	1.5X	1X	0	0	0	1999 EPA Ammonia Criteria
Aquatic Life	Acute Toxicity	3.53	13X	6X	2X	0	0	0	0	0	Freshwater Mussels ²
Aquatic Life	Chronic Toxicity	0.301	150X	74X	18X	7X	5X	1.3X	2X	1.5X	Freshwater Mussels ²

¹ From SRCSD dilution modeling, which we have not verified. ² 2009 Draft EPA Ammonia Criteria and literature cited therein.

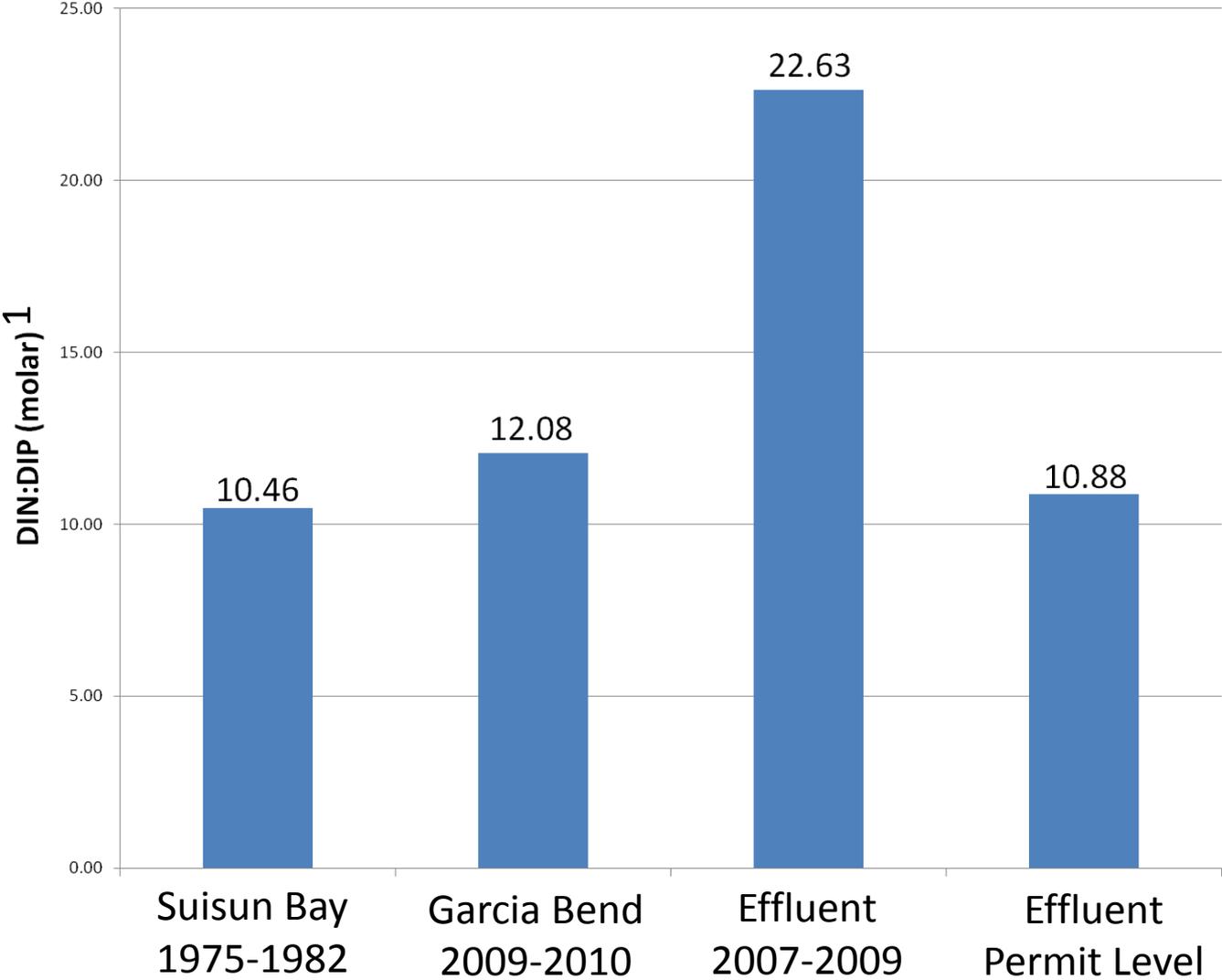
Nitrate Limit of 10 mg/L Should be Upheld— Not Remanded

- Draft Order properly affirms that a new permit limit for nitrate is needed to protect beneficial uses
- There is ample evidentiary support in the record to support the permit's 10 mg/L nitrate limit
 - Antidegradation Policy: 10 mg/L is BPTC
 - 10 mg/L nitrate limit is necessary to restore the N:P ratio of receiving waters to a level that protects the aquatic ecosystem
 - 10 mg/L is needed to protect MUN use and public health

The Draft Order Should be Revised to Include a BPTC Basis for 10 mg/L Nitrate Limit

- This new nitrate waste load is subject to antidegradation and BPTC
 - Only de-nitrification will reduce nutrients from the discharge
 - BPTC is 10 mg/L; standard achieved by numerous “similarly situated dischargers”
- Inconceivable that nitrate > 10 mg/L consistent with “maximum benefit”

Target Nitrogen to Phosphorus Ratio Supports 10 mg/L Limit



¹ Effluent P is measured as TP; however, in-river P measurements indicate that effluent PO₄ is likely >90% of total P

The record is replete with evidence of impacts to beneficial uses and public health



Algae bloom in San Luis Reservoir, 2004
Photo by F. Brewster



Water hyacinth in slough near Elk Grove,
Photo by CA Dept. of Boating and Waterways



Microcystis bloom, 2008
Photo by P. Lehman

The Draft Order Should be Corrected to be Consistent with Documented Impacts from Nutrients on MUN Beneficial Uses

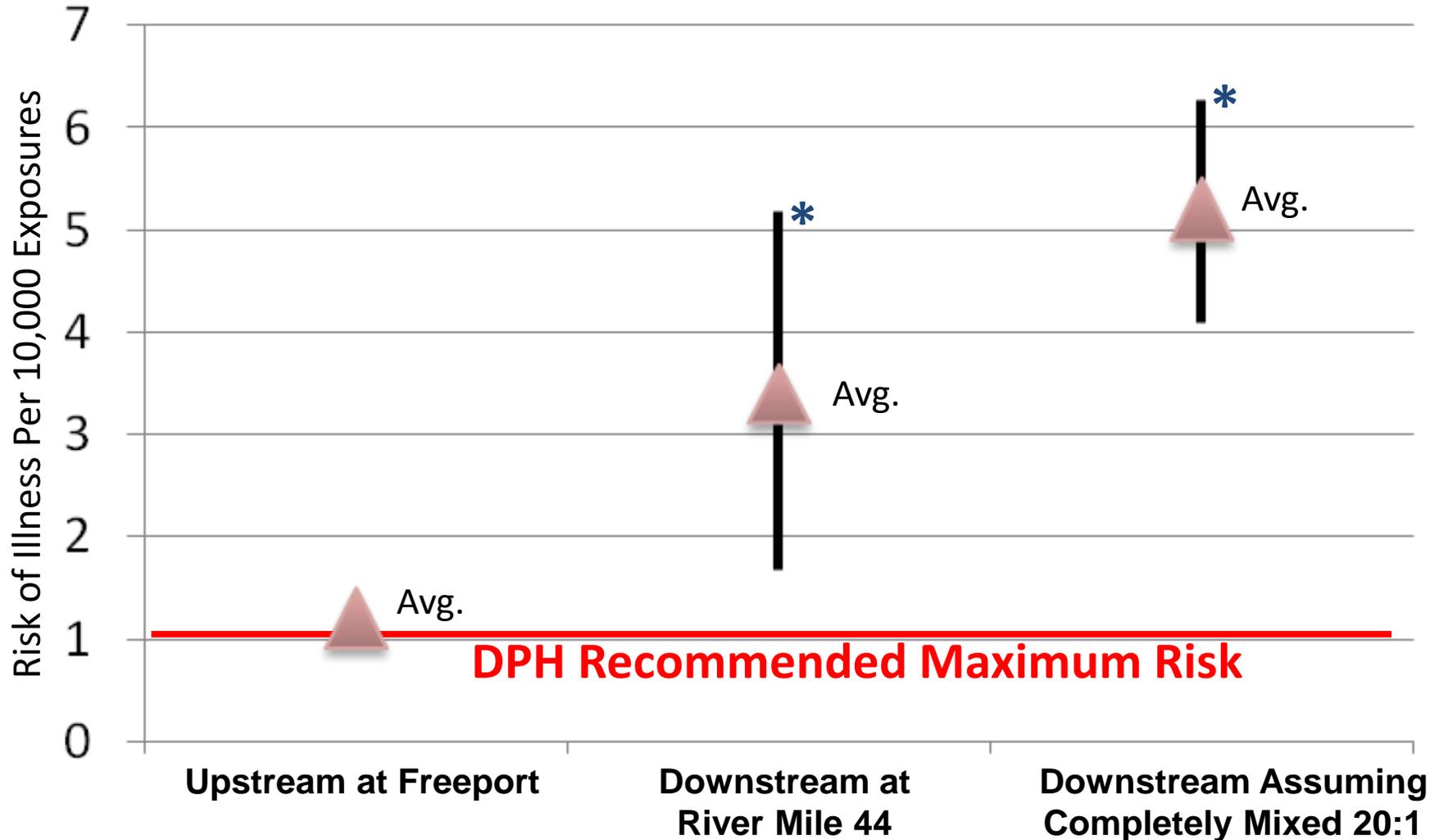
- After nitrification, impacts from excessive nutrients will continue because of new nitrate load
- Algal blooms in downstream facilities cause:
 - Taste and odor complaints
 - Filter clogging and increased treatment costs
 - Need for taste and odor control
 - Copper sulfate treatment
 - Activated carbon treatment
 - Ozone
- Increased TOC and Disinfection Byproducts formation

We have one point on tertiary filtration:

- **SRCSD does not like the results of its own risk assessment, and has taken great pains to try to marginalize those results**
 - The results are not marginal; they plainly show unacceptable excess risk to swimmers
 - Even SRCSD recognized that swimming risk should drive the analysis

Gerba Risk Study for SRCSD

Risk of Illness to Swimmers from *Giardia* & *Cryptosporidium* Combined



* Line shows 95% confidence interval, where risk w/in range 95% of time

Our Final Point: the Permit's Thermal Plan Exception Should be Rescinded

- SRCSD has been granted exception to Thermal Plan for 20+ years
- Fact: receiving water ambient temperatures at times already exceed temperatures at which survival of juvenile Chinook salmon declines
- Fact: Thermal Plan exception allows SRCSD to discharge waste water 25°F warmer than receiving waters
- Conclusion: discharge is degrading critical habitat, harming listed species

Conclusion

- Public Water Agencies support draft order with following requests to State Board:
 1. Compress the compliance schedule
 2. Direct Regional Board to set reduced interim limits and require feasible interim measures
 3. Uphold 10 mg/L nitrate limit, without remand
 4. End Thermal Plan exception
 5. Incorporate into draft order other supporting legal authorities (e.g., Antidegradation, ESA, water rights principles) and clearly identify multiple independent lines of evidence supporting permits limits

Supplemental Slides

SRCSD Out of Step with Many Other POTWs In Region

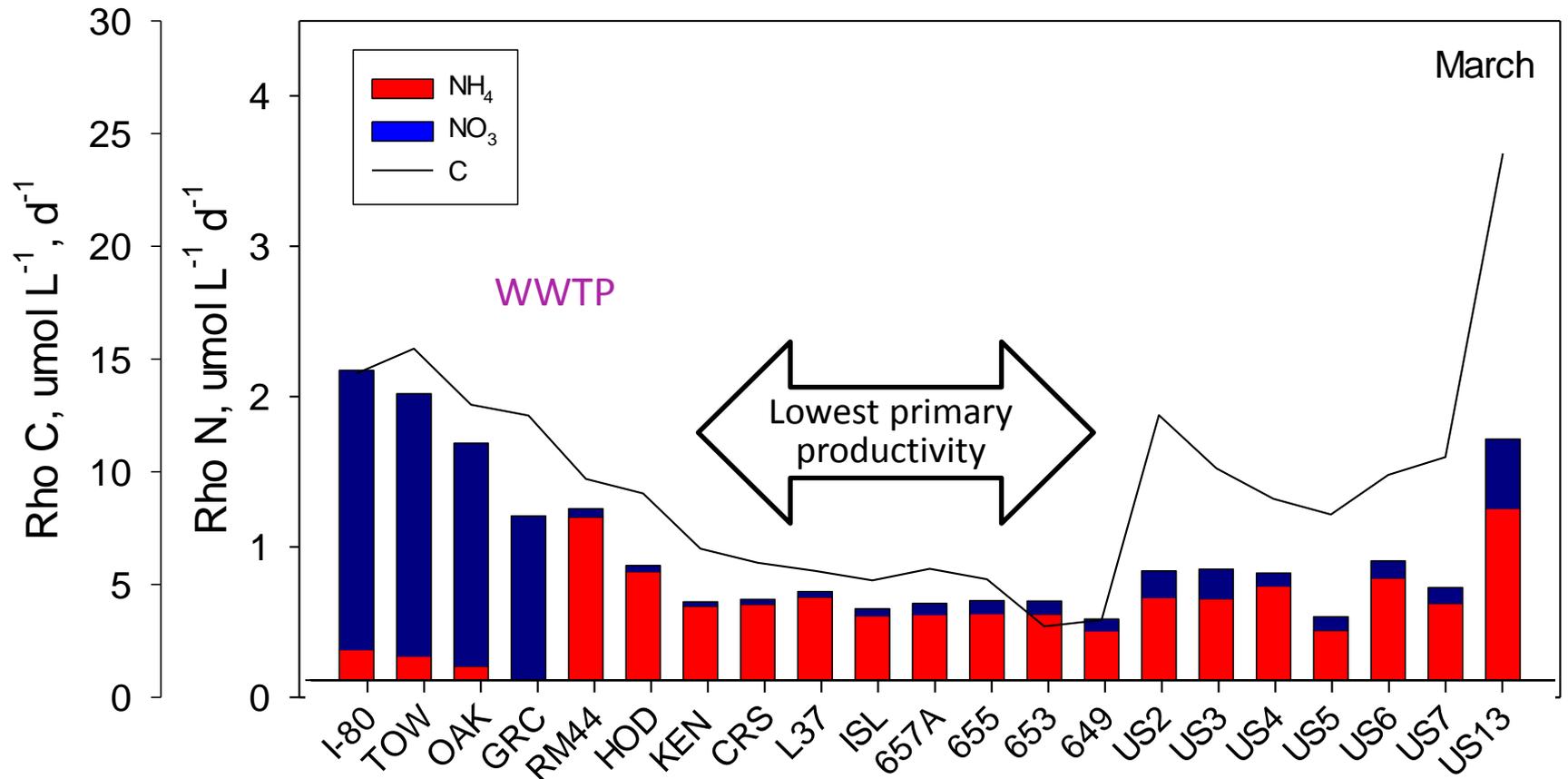
Discharger	Permitted Average Dry Weather Flow, mgd	Treatment Requirements	
		Nitrification or Nitrification/ Denitrification	Tertiary Filtration
Sacramento	181	✓	✓
Modesto (* Tertiary upgrades underway)	70	✓*	✓*
Stockton	55	✓	✓
Turlock	20	✓	✓
Roseville - Dry Creek	18	✓	✓
Manteca	17.5	✓	✓
Tracy	16	✓	✓
Roseville - Pleasant Grove	15	✓	✓
Vacaville	15	✓	✓
Woodland	10.4	✓	✓
Lodi	8.5	✓	✓
Davis	7.5	✓	✓
Mountain House	5.4	✓	✓
Olivehurst	5.1	✓	✓
Brentwood	5.0	✓	✓
Linda County Water District	5.0	✓	✓
Galt	4.5	✓	✓
El Dorado Irrigation District – El Dorado Hills	4.0	✓	✓
El Dorado Irrigation District – Deer Creek	3.6	✓	✓
Grass Valley	2.78	✓	✓
Placerville	2.3	✓	✓
Placer County Sewer Maintenance District	2.18	✓	✓
Auburn	1.67	✓	✓
Willows	1.2	✓	✓
Rio Vista – Northwest	1.0	✓	✓

Ammonium Impairs the Base of the Food Web

Down river algal physiology:

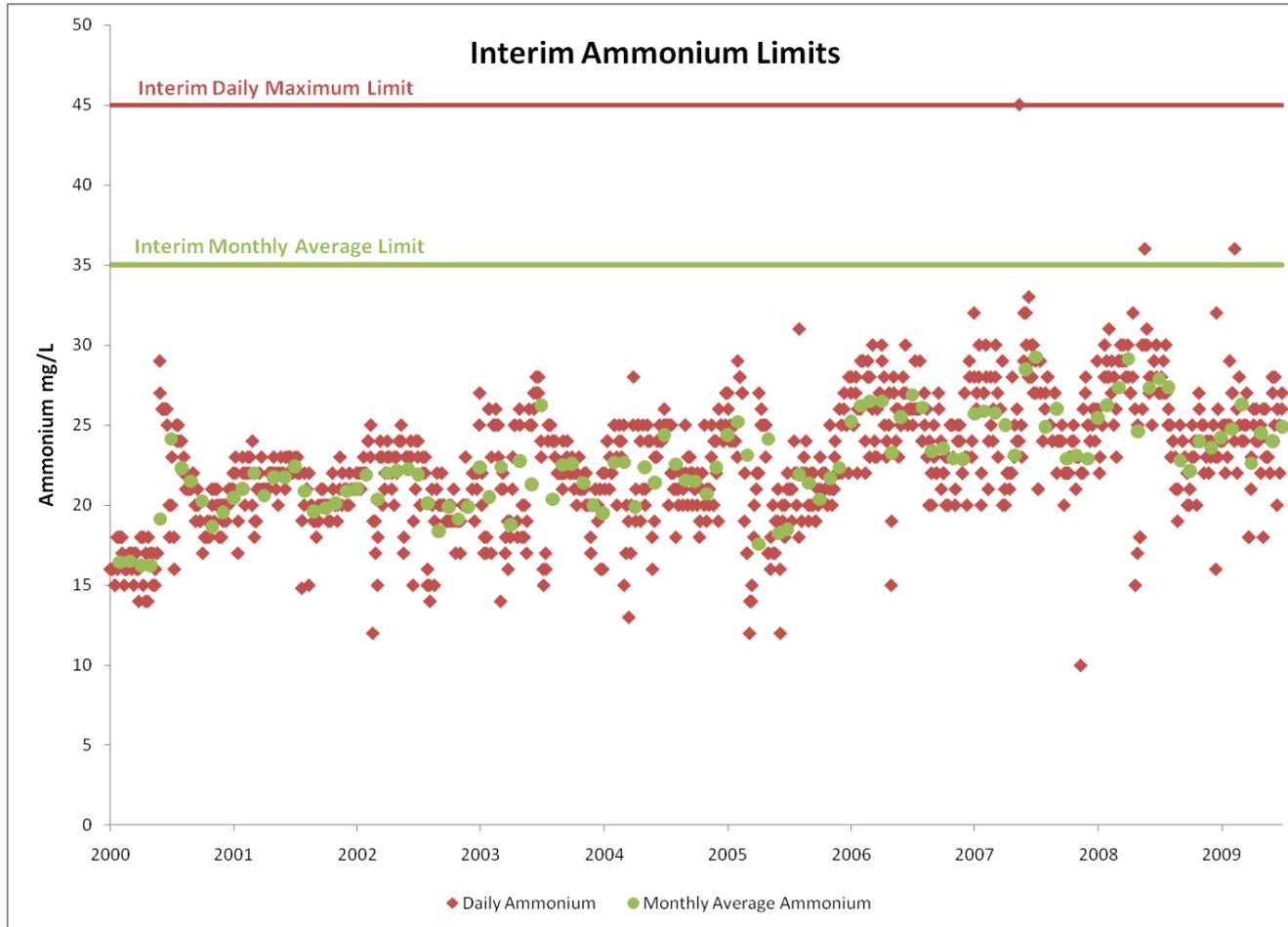
Nitrate uptake essentially stops at the WWTP

Primary Production declines at WWTP

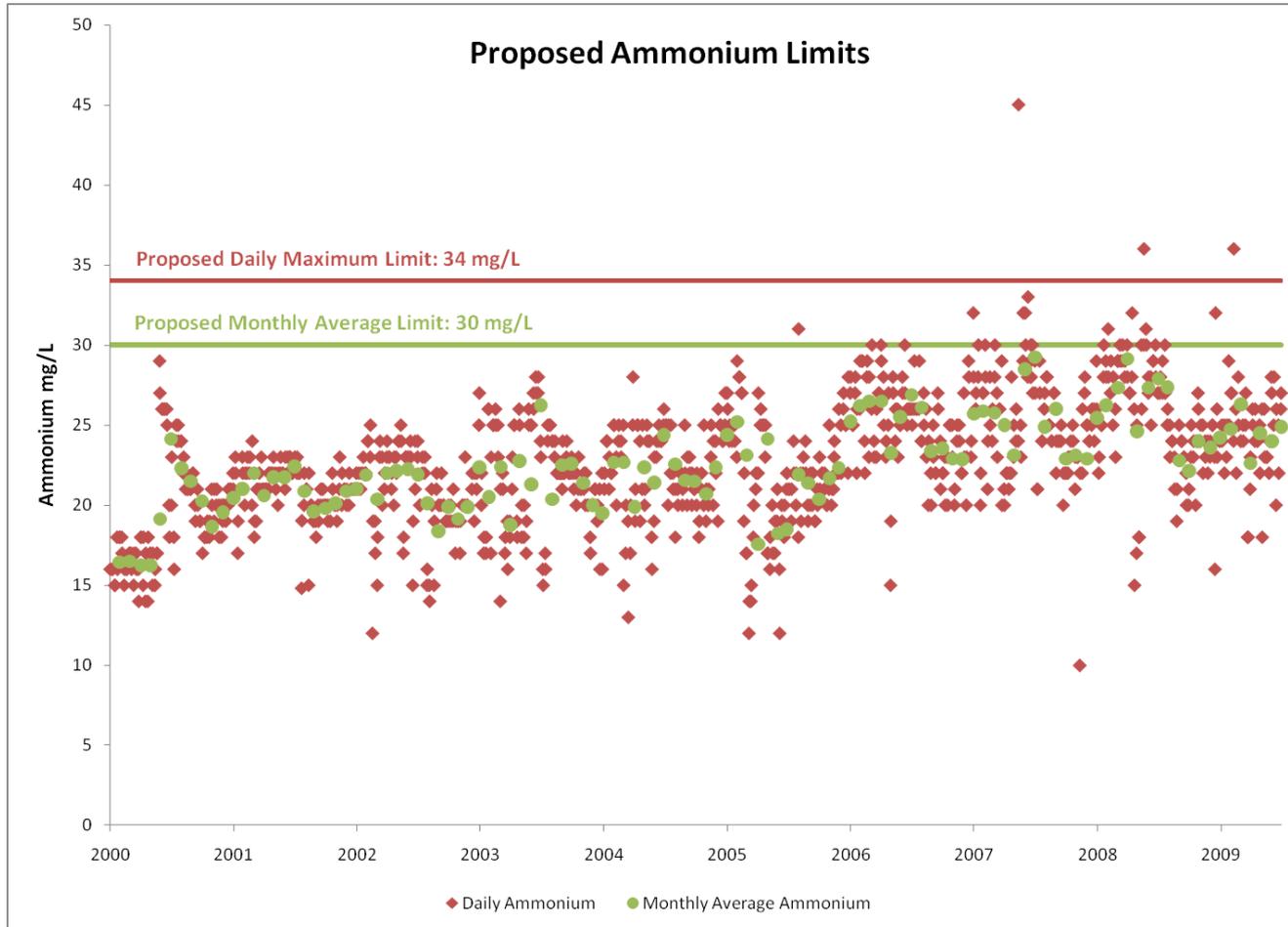


Parker *et al* 2010

Interim Limits are too High and Lower Levels can be Attained



Interim Limits are too High and Lower Levels can be Attained (cont.)



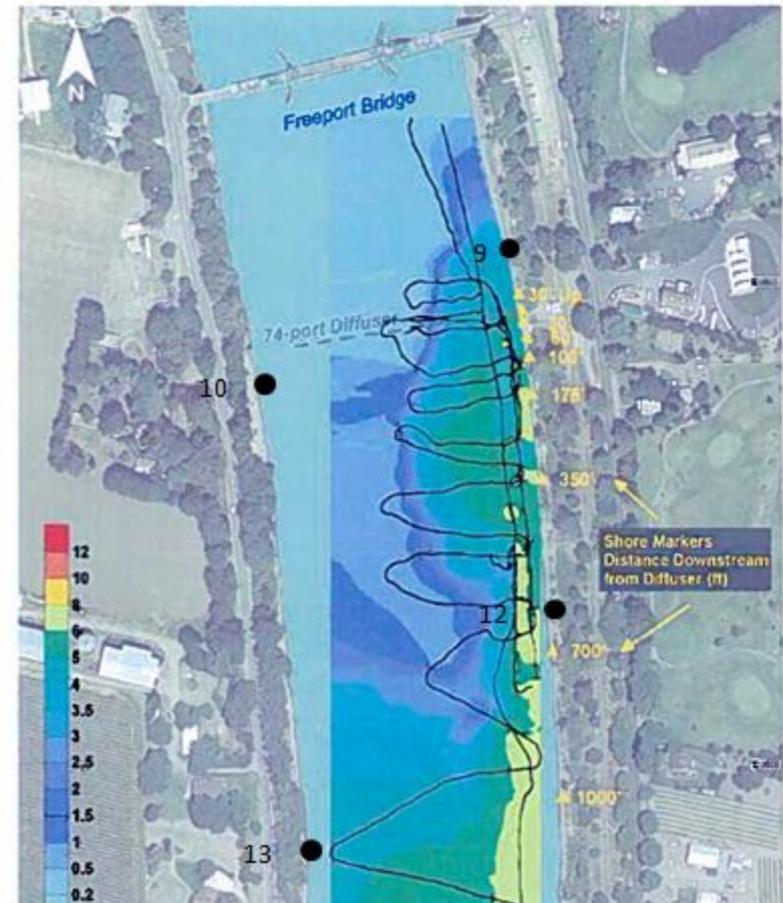
Title 22 Equivalent is Necessary to Protect AGR, REC, MUN Uses

Dye studies show less than 20:1 dilution at ag diversions and areas with contact recreational use.

Entire Sacramento River and Delta are designated MUN

- High quality source water essential to multiple barrier approach to public health protection
- Freeport Diversion operated out of concern of SRCSD discharge
- Planning studies underway to locate new water diversions on the Sacramento River

Water Diversions in Near-Field Mixing Zone



10:1 Effluent Concentrations Occur At Surface 175 Feet Downstream

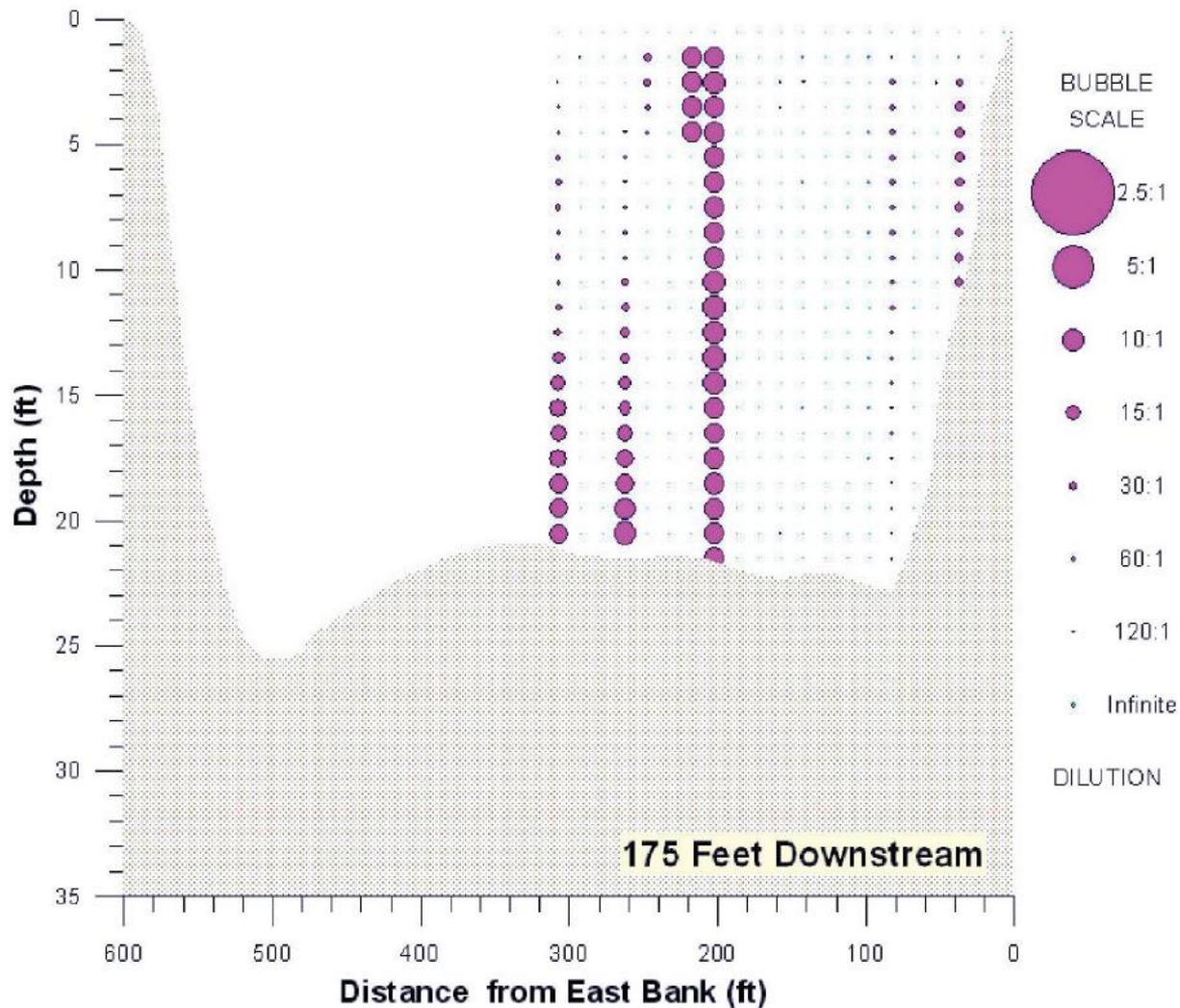


Figure A-20 Cross Section Dilution Bubble Plot, 175 Feet Downstream, Second Run

Bubble Plot_dil_175a.png