

**303(d) Listing for  
Unknown Toxicity on the  
Kings River:  
Evidence in Support of  
Not Listing**

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June 11, 2009

# Lines of Evidence: Water Flea *Ceriodaphnia dubia*

- One Incidence of Statistical Mortality in 50 samples
  - 75 percent survival reported Sept. 5, 2006 at Manning Ave ILRP site
- Does Not meet Listing Requirements under Table 3.1 (requires 5 of 50 samples to list)

# Lines of Evidence: Fathead Minnow

## *Pimephales promelas*

- Two Incidences of Statistical Mortality in 50 Samples
  - One at Manning Ave ILRP site on Feb. 23, 2006 showed 88 percent survival
  - One at Lemoore Weir ILRP site on Feb. 23, 2006 showed 55 percent survival
- Does Not meet Listing Requirements under Table 3.1 (requires 5 of 50 samples to list)

# Lines of Evidence: Algae *Selenastrum capricornutum*

- Issues with REDUCED GROWTH since inception of ILRP
- All Algae tests referenced for listing run through same laboratory
- No chemical constituents identified in Phase II testing as cause of “toxicity”
- All samples showed **Positive** growth, but not at same growth rate as of control

# Lines of Evidence: Algae

## *Selenastrum capricornutum*

- Investigation
- Regional Board Staff in Fresno Office collected a water sample on same date and location (September 2006) as KRCD and sent it to Fish and Game lab
  - **No Significant Differences detected by Fish and Game, but Significant Differences by KRCD contracted lab**
- Second Split-Sample study sent samples to KRCD contracted lab and identical samples to Fruit Growers Laboratory (one storm sample, one irrigation sample)
  - **Both FGL samples came back as NO SIGNIFICANT DIFFERENCE**
  - **KRCD samples showed Significant Differences**

# Lines of Evidence: Algae *Selenastrum capricornutum*

## ■ Investigation

- 1. Considerable freedom exists within method leading to inconsistent results from one lab to another (not comparable data)
- 2. Client (KRCD) not told initially that control water in test could be reformulated to match hardness levels of sample water
  - Control water at primary lab was **6 times higher** in both Electrical Conductivity and Hardness than Kings samples

# Control vs Sample Water

Constituent	Units	<b>SFL</b>	APPL 02-21-07	APPL 03-01-07	APPL 03-13-07	APPL 04-11-07
EC	umhos/cm	<b>184</b>	<b>31.2</b>	<b>31.5</b>	<b>33.3</b>	<b>35</b>
TDS	mg/L	<b>110</b>	<b>22</b>	<b>26</b>	<b>24</b>	<b>26</b>
Hardness	mg/L	<b>88</b>	<b>10.1</b>	<b>10</b>	<b>12.1</b>	<b>13</b>

# Lines of Evidence: Algae *Selenastrum capricornutum*

## ■ Investigation

- This fact, according to a USGS researcher familiar with this test, contributes to a “shock effect” on the algae, which delays its growth curve (osmotic shock effects?)
- A special test run to 8 days (method time is 4 days) confirmed that the sample will statistically match the control sample after the shock effect subsides



# Lines of Evidence: Algae

## *Selenastrum capricornutum*

### ■ Investigation

- Tests run May 2009 using hardness matching water as a control sample showed that the river sample actually matched or exceeded the control in algae growth
  - Water sample was collected from a site with no agricultural activity upstream
- All future algae tests under the new MRP to be run in a similar manner (toxicity will be because of a chemical constituent, not because of the control water)

# Lines of Evidence: Algae *Selenastrum capricornutum*

## ■ Conclusion

- All previous tests available to Regional Board Staff (via ILRP reports and SWAMP) were run with Control waters running 6 times (minimum) higher in EC and Hardness than sample water
- Shock effect of placing test organism in “softer, less saline” water temporarily inhibited growth
- Reformulating Control Water to match sample water EC and Hardness shows no toxicity effects

# Conclusions

- Water Flea and Fathead Minnow data insufficient to list under Table 3.1 of the Listing Policy
- Lab issues with regards to Control Water makeup lead to the statistical differences in sample vs. control tests, primarily due to freedom within prescribed method
  - **Said freedom does not allow for comparison between labs for the algae testing (inconsistent application of method)**
- This resulted in the “toxicity” seen in the algae tests, not because of an agriculturally related constituent

# Conclusions

- Request that 303(d) listing for Unknown Toxicity on the Kings River be **Rejected** or **Delayed** 1-year to reevaluate the impact of the method on the results obtained
- This issue is currently before the ILRP TIC, and has been discussed by the labs and staff for the last 2 years