



**REPORT TO REGIONAL WATER SUPPLY COMMISSION  
MEETING OF WEDNESDAY, MAY 2, 2012**

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**SUBJECT      WATER QUALITY TRENDS IN SOOKE LAKE RESERVOIR IN MARCH 2012**

**ISSUE**

To provide information on the water quality conditions observed in Sooke Lake Reservoir during March 2012 and compare these data with those from previous years and long-term averages.

**BACKGROUND**

**Physical Parameters**

*Water Levels.* The water level in Sooke Lake Reservoir reached full pool on January 23, 2012, about one month later than in 2010 (**Figure 1**) and was still spilling at the end of March.

*Water Temperature.* The water temperature was slightly below the long-term average throughout the month of March (**Figure 2**). (**Note:** The small circles on the chart show the extent of water temperature variation in previous years.)

**Water Clarity**

*Turbidity.* During March, the turbidity of the water in Sooke Lake Reservoir was slightly lower than the 10-year average and rose to just above the long-term average by the end of the month. The turbidity remained well below the 1.0 NTU turbidity limit (**Figure 3**).

*Water Transparency.* Similar to turbidity, throughout March the transparency of the water in Sooke Lake Reservoir continued to be better (clearer) than the 10-year average (**Figure 4**) and is returning to the very clear water observed prior to raising the water level in the reservoir.

**Bacteria**

*Total Coliform Bacteria.* In March, the total coliform concentrations in the raw source water entering the Japan Gulch Disinfection Plant from Sooke Lake Reservoir continued to be well below the 10-year average and slightly below levels observed in 2010 and 2011 (**Figure 5**). *E. coli* concentrations remained low throughout March and well below the USEPA limit to remain an unfiltered supply (see insert in **Figure 5**).

**Nutrients**

*Phosphorus.* In the south basin, the total phosphorus was lower than the long-term average at the beginning of March, spiked sharply in mid-March for unknown reasons and returned to below the long-term average by the end of March. The increase in March was similar to a spike seen in early March 2010 (**Figure 6**). In the north basin, no similar increase was noted with total phosphorus levels remaining lower than the long-term average and similar to recent years. (**Figure 7**).

*Nitrogen.* In March, the total nitrogen levels in both the south and north basins were lower than the 10-year average (**Figures 8 and 9**).

### Chlorophyll-a

In March, chlorophyll-a concentrations were similar to or slightly higher than the 10-year average throughout Sooke Lake Reservoir (**Figures 10-12**). These concentrations are relatively low for a surface water reservoir and reflect the normally low levels of nutrients (especially phosphorus) in this water body.

### Algae

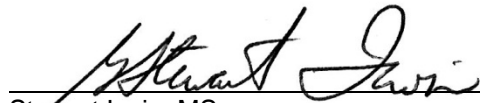
In March, *Asterionella formosa* and *Tabellaria fenestrata* (both diatoms) continued to dominate the algal flora. The concentration of *Asterionella formosa* was substantially higher than the long term average for this time of year. However, values remained well within the species variation that has been observed in Sooke Lake Reservoir in the past. There were no associated water quality issues.

### CONCLUSION

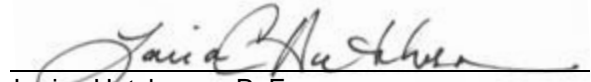
The water quality tests conducted for Sooke Lake Reservoir in January and February continue to show good quality source water with no water quality issues.

### RECOMMENDATION

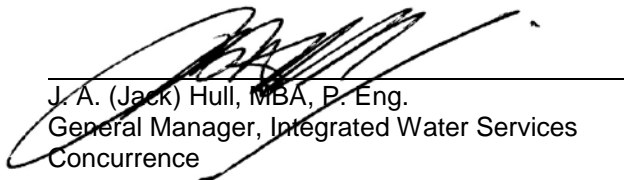
That the Regional Water Supply Commission receive this report for information.



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Figure 1. Water Level Elevation in Sooke Reservoir, 2009-2012

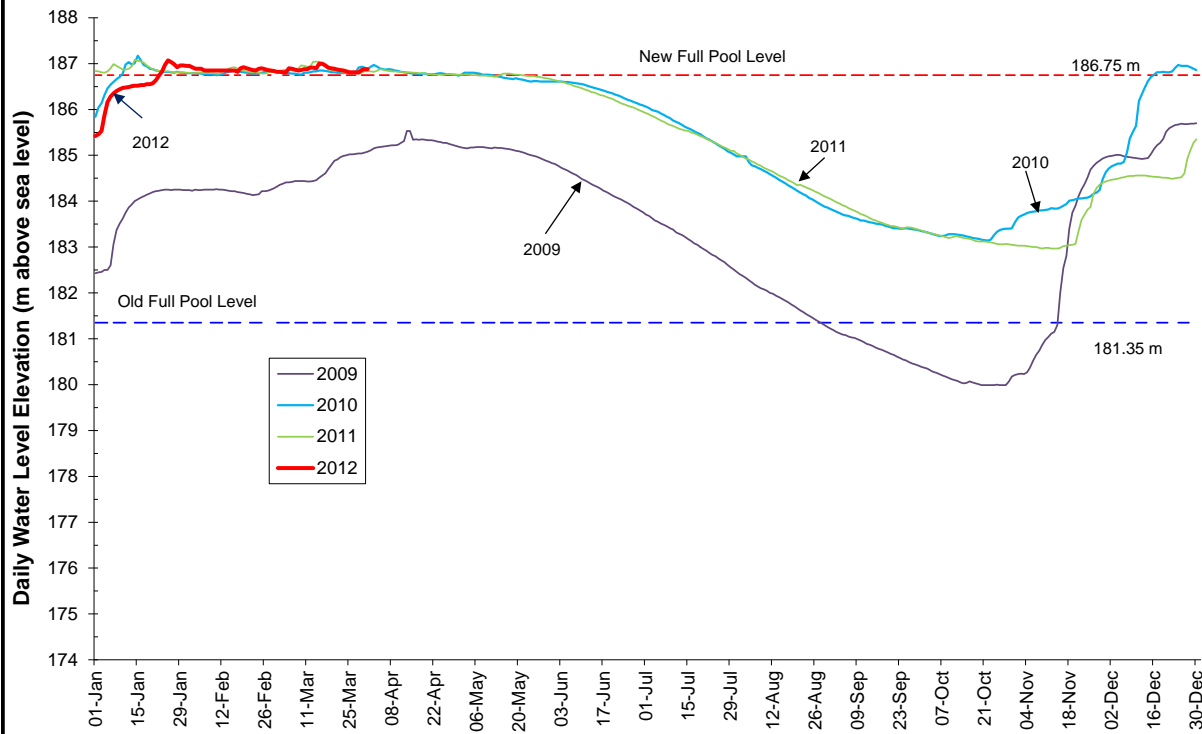
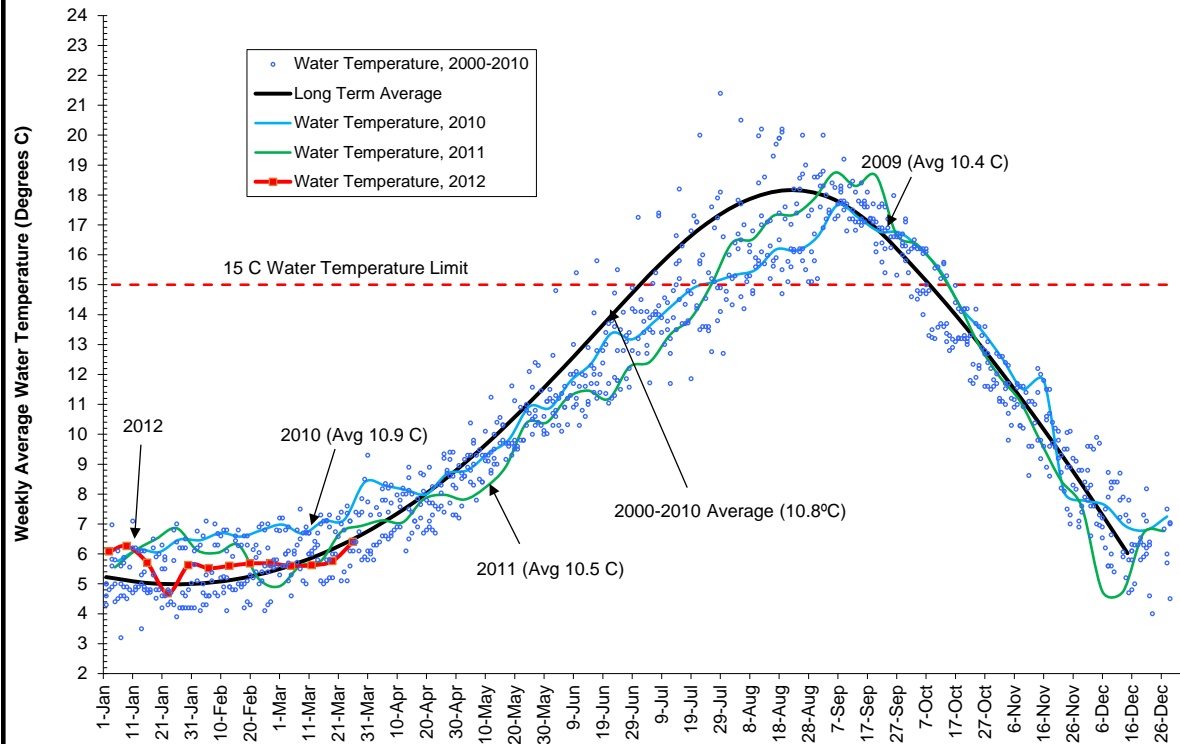
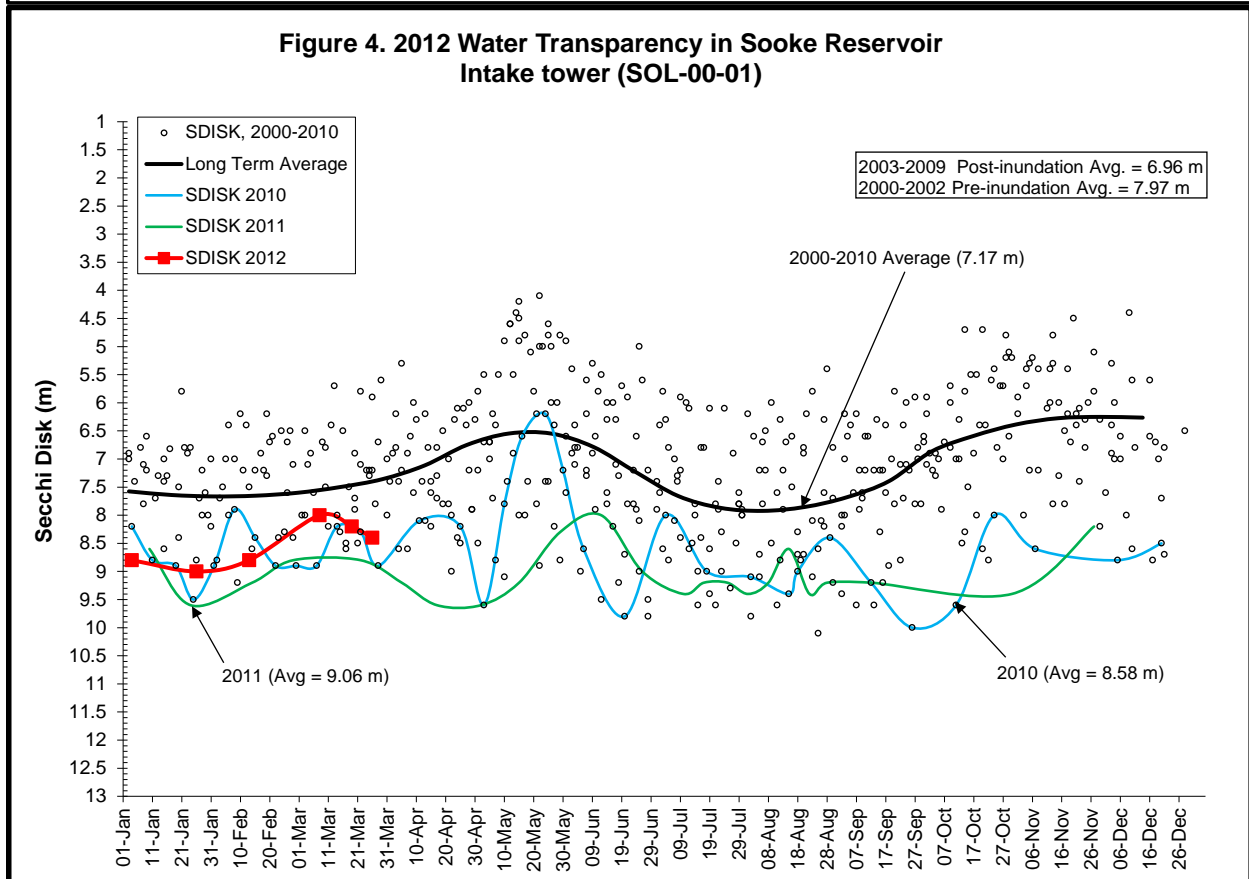
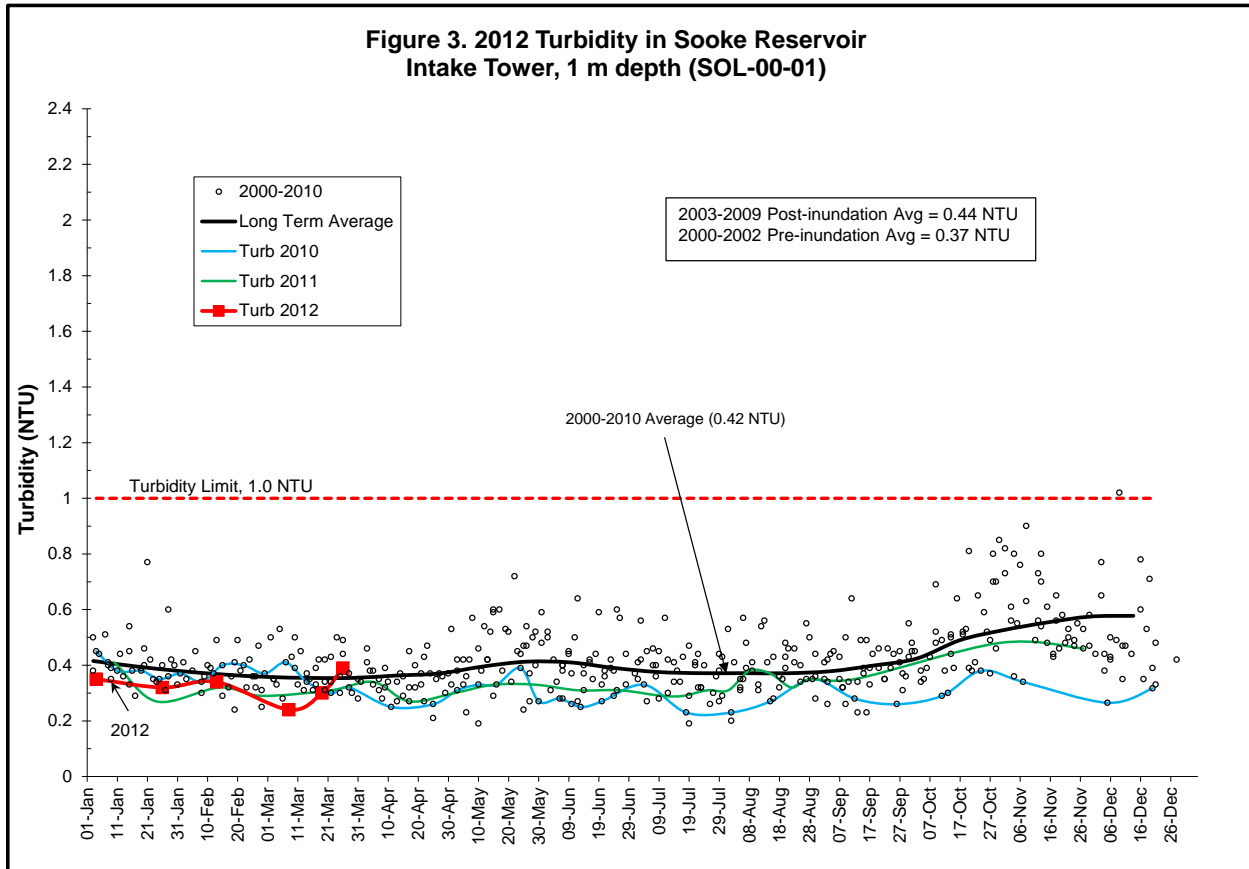
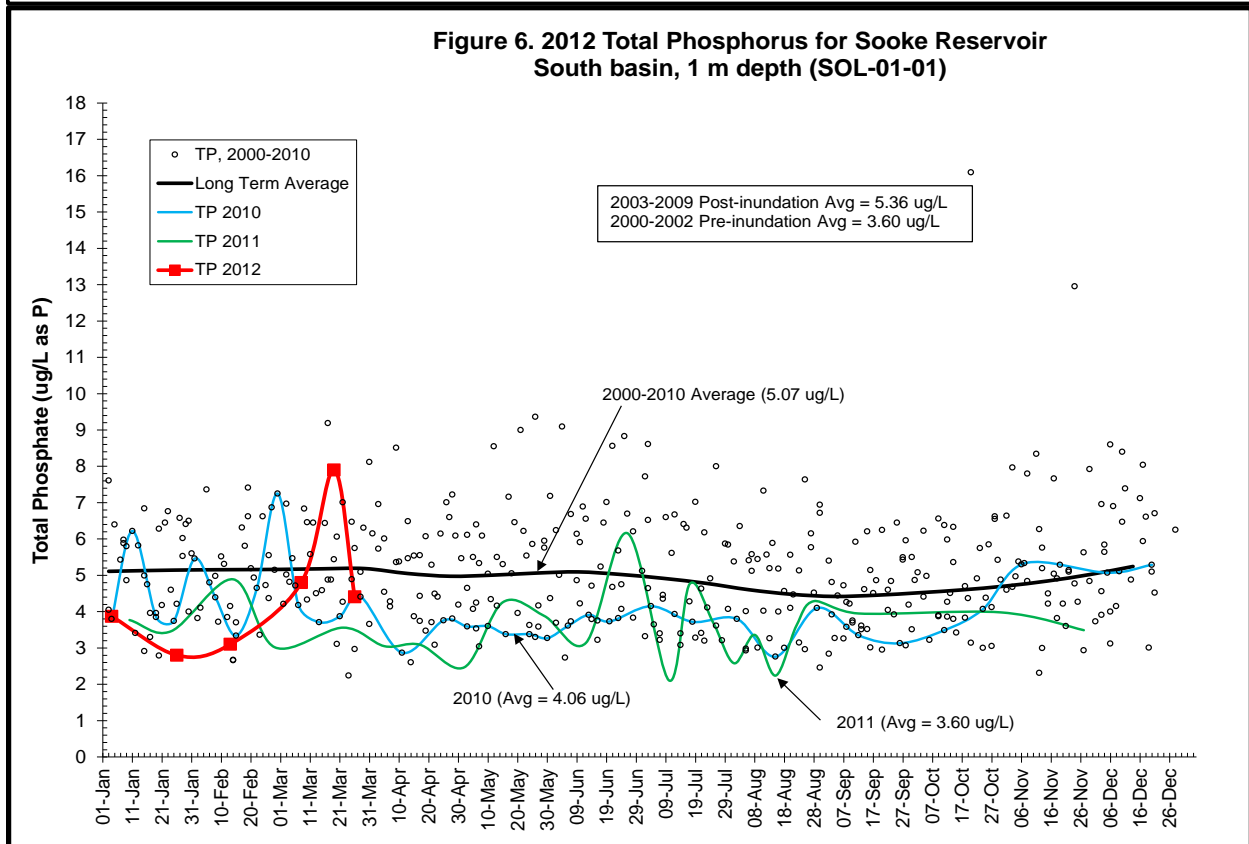
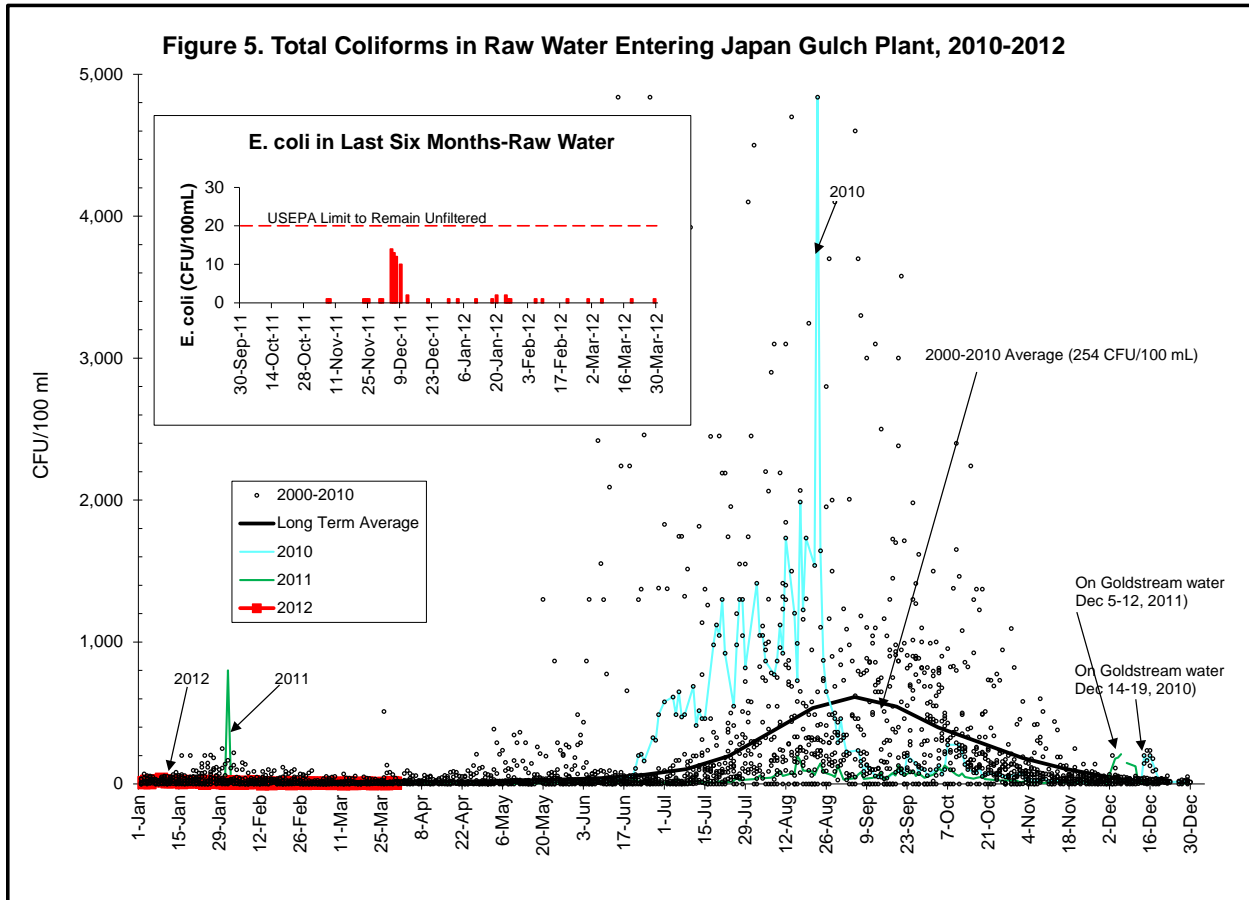
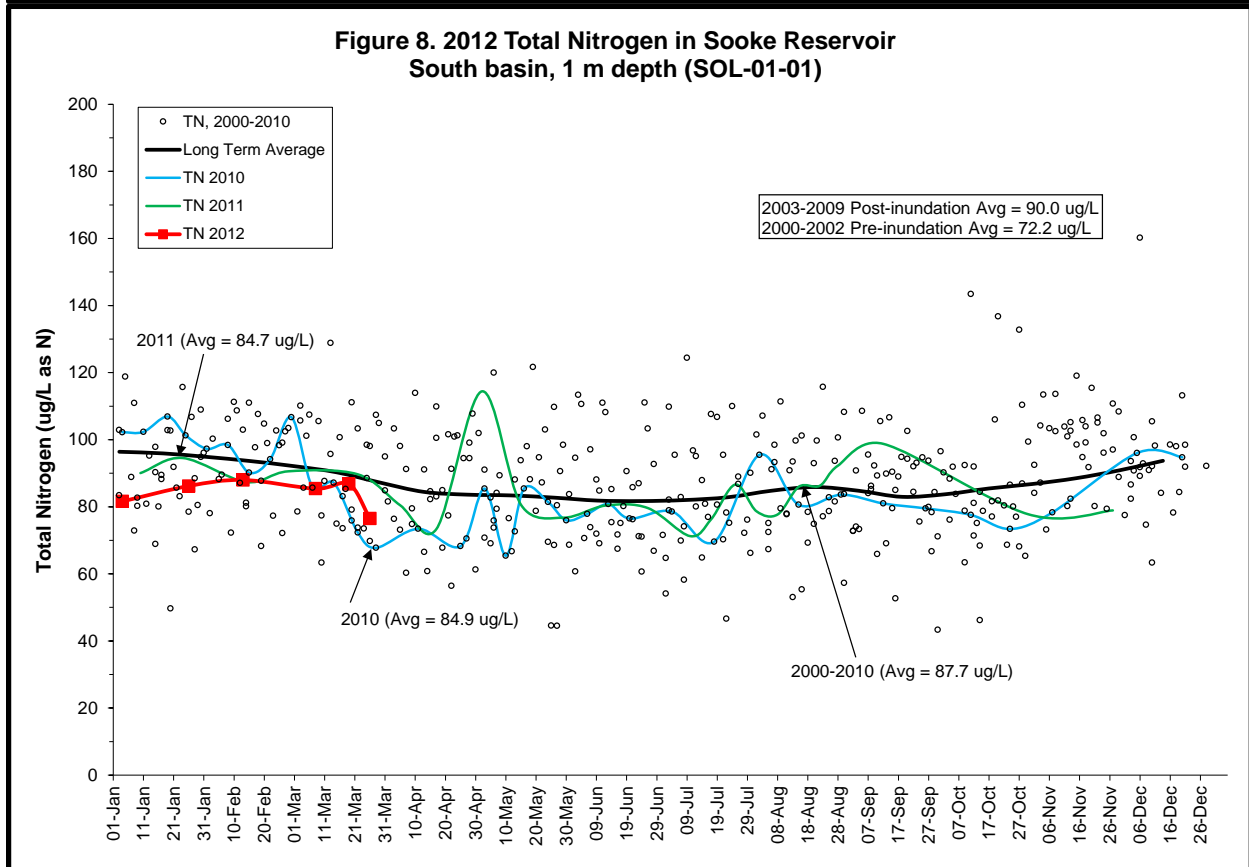
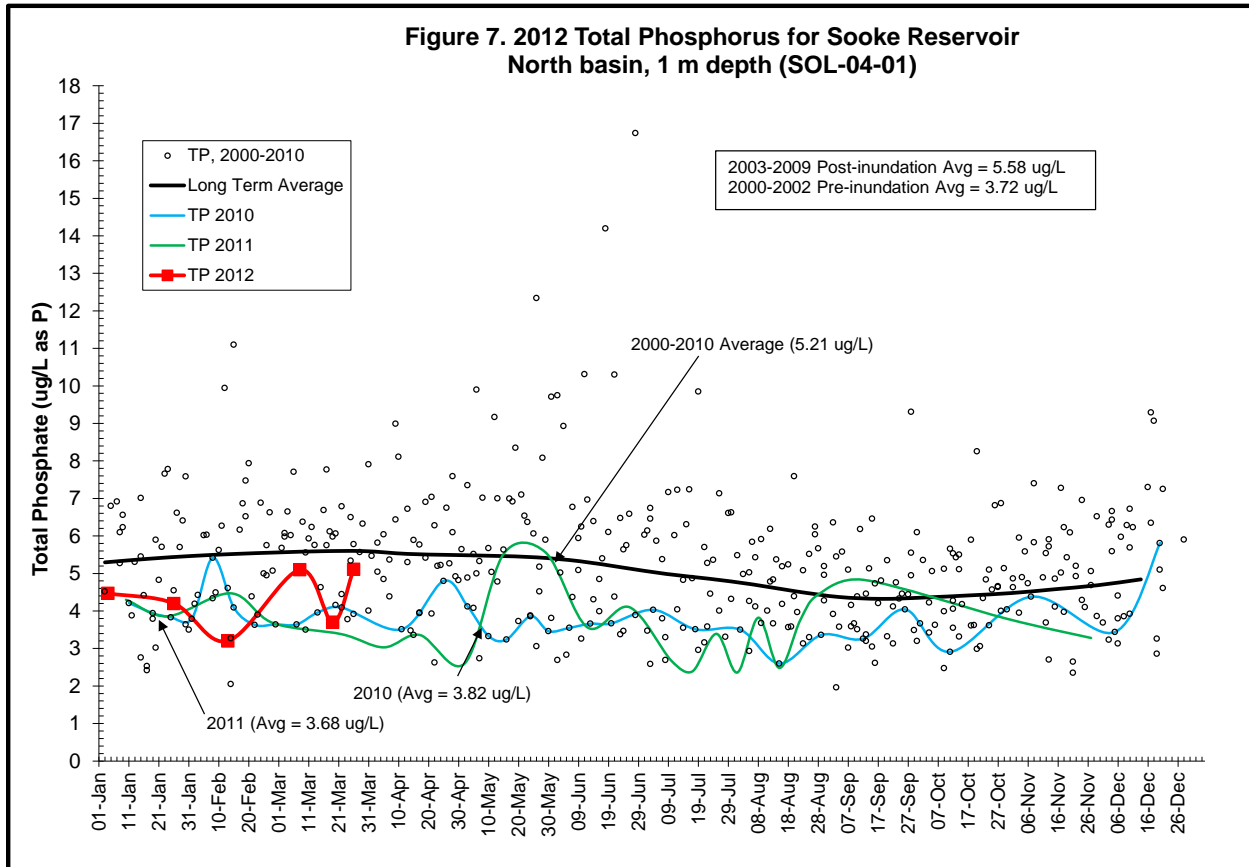


Figure 2. 2012 Temperature of Raw Water entering Japan Gulch Plant (Weekly Average)









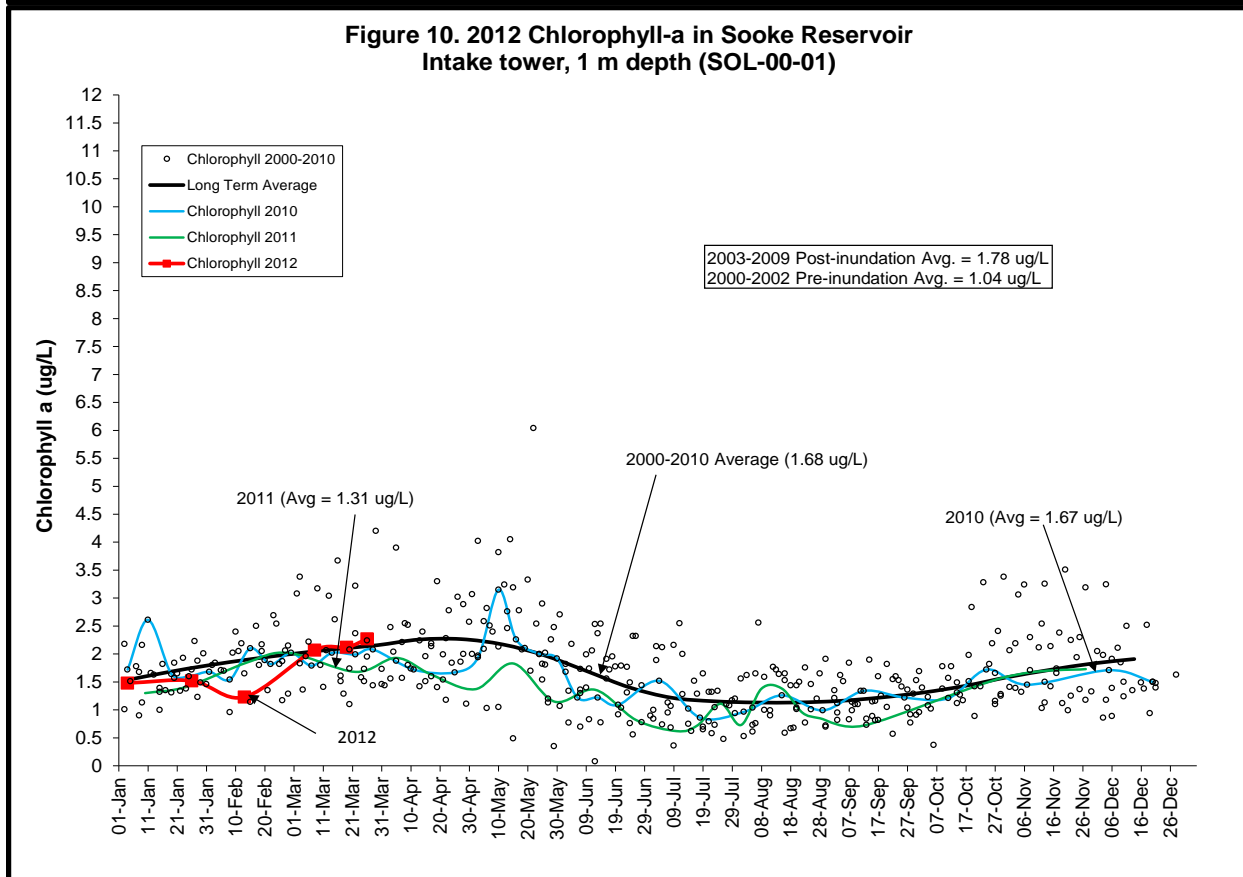
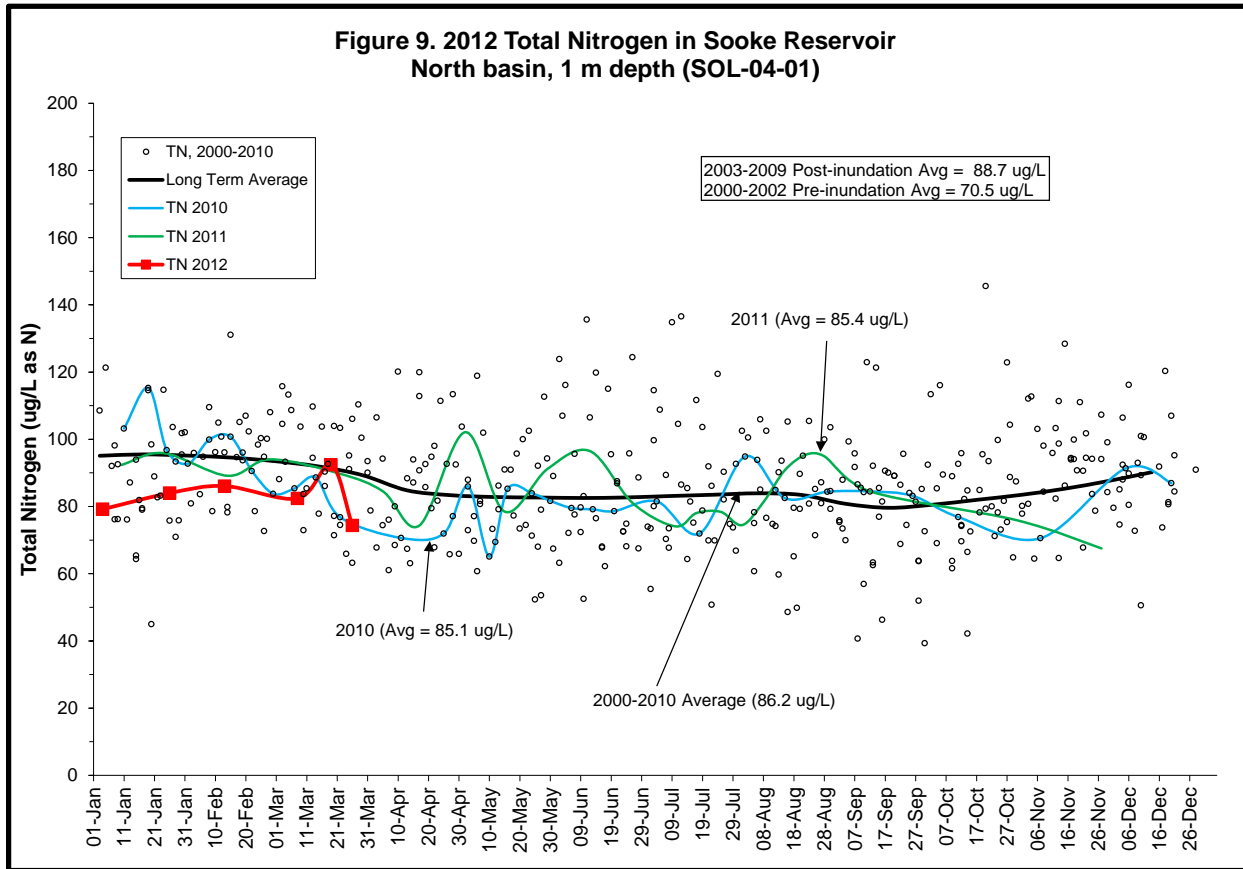


Figure 11. 2012 Chlorophyll-a in Sooke Reservoir Intake tower, 5 m depth (SOL-00-05)

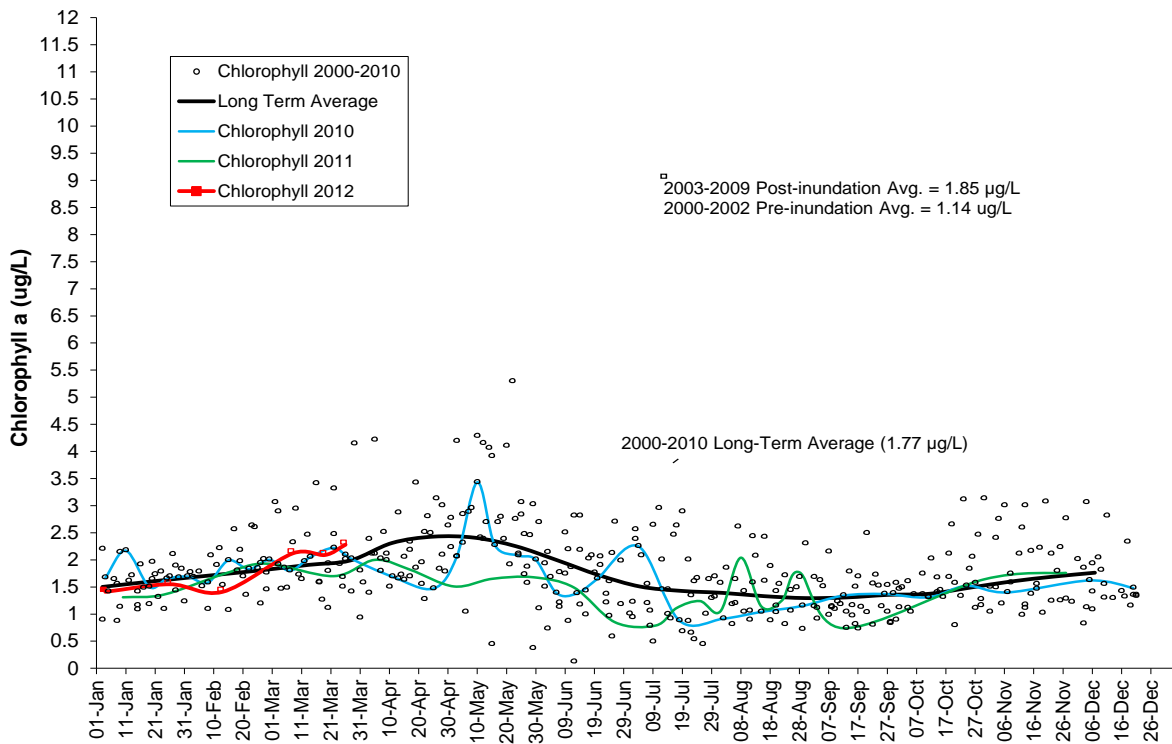


Figure 12. 2012 Chlorophyll-a in Sooke Reservoir intake tower, 10 m depth (SOL-00-10)

