CAPITAL REGIONAL DISTRICT

Agenda Item #9
REPORT #RWSC 2007 - 06

REPORT TO REGIONAL WATER SUPPLY COMMISSION
MEETING OF WEDNESDAY, 21 FEBRUARY 2007

SUBJECT WATER QUALITY TRENDS IN SOOKE RESERVOIR IN JANUARY 2007

SUMMARY

The water quality tests conducted for Sooke Reservoir during January 2007 showed continued good quality water. During January, a healthy diversity of algae that are typical of winter populations were observed.

PURPOSE

This report provides information on the water quality conditions observed in Sooke Reservoir during the month of January 2007 and compares these data with those from previous years and long-term averages.

REPORT

Physical Parameters

*Water Levels***.** During the month of January, Sooke Reservoir continued to spill (**Figure 1**). The total spillage from the reservoir as of January 31, 2007 was approximately 9 billion gallons.

Water Temperature. During January, the weekly average temperature of the water entering the Japan Gulch Plant remained close to the long term average (**Figure 2**). By month end, the weekly temperature of the water entering the Japan Gulch Plant was about 5ºC.

Water Clarity

Turbidity. During the early part of January, the turbidity (cloudiness) of the surface water in Sooke Reservoir was slightly above the long term average in the south basin and well above the long term average in the north basin (approx 0.52 NTU and 0.86 respectively) (**Figure 3)**. The water entering the system continued to be well below the turbidity limit listed for drinking water in the *Guidelines for Canadian Drinking Water Quality*. The slight increase in turbidity was due to the rain events in early January.

Water Transparency. Similar to the turbidity, the transparency of the water (as measured by observing a black and white disk under the water) in the north basin of Sooke Reservoir declined slightly in early January due to the rainfall events and by month end improved reaching levels close to the long-term pre-inundation average at the Intake Tower (**Figure 4**).

Bacteria

The total coliform bacteria concentration in the water entering the Japan Gulch Plant from Sooke Reservoir remained low throughout January. By month end, the total coliform level was about 30 colony forming units per 100 mL. This was similar to previous years and typical of winter conditions.

Nutrients

Phosphorus. During January, the total phosphorus concentrations rose slightly and remained steady at about 100% higher than the long-term pre-inundation average in both the south (**Figure 5**) and north basins (**Figure 6**) of Sooke Reservoir. (**Note**: In the charts, the bars on each data point indicate the range of data observed from triplicate samples.) Over the longer term, the early filling and spilling of Sooke Reservoir should provide a benefit for water quality as it should act to flush the reservoir of higher nutrients.

Nitrogen. Total nitrogen levels in January were only slightly higher than the long-term pre-inundation average in both the south (**Figure 7**) and north basins (**Figure 8**) of Sooke Reservoir.

Chlorophyll-a

In January, chlorophyll-a concentrations (a general measure of algal populations) at the Intake Tower (**Figure 9**) and the north basin (**Figure 10**) in Sooke Reservoir continued to decline and reached pre-inundation levels, typical of the winter season.

Algae

In January, algal populations in Sooke Reservoir remained relatively low indicative of lower winter algal populations.

Inundation Scientific Advisory Working Group

The Sooke Reservoir Inundation Scientific Advisory Working Group did not meet in January and is not scheduled to meet in February. The next scheduled meeting is for March of 2007.

RECOMMENDATION

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

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Senior Manager, Water Quality

Figure 1. Water Level Elevation in Sooke Reservoir, 2003-2006

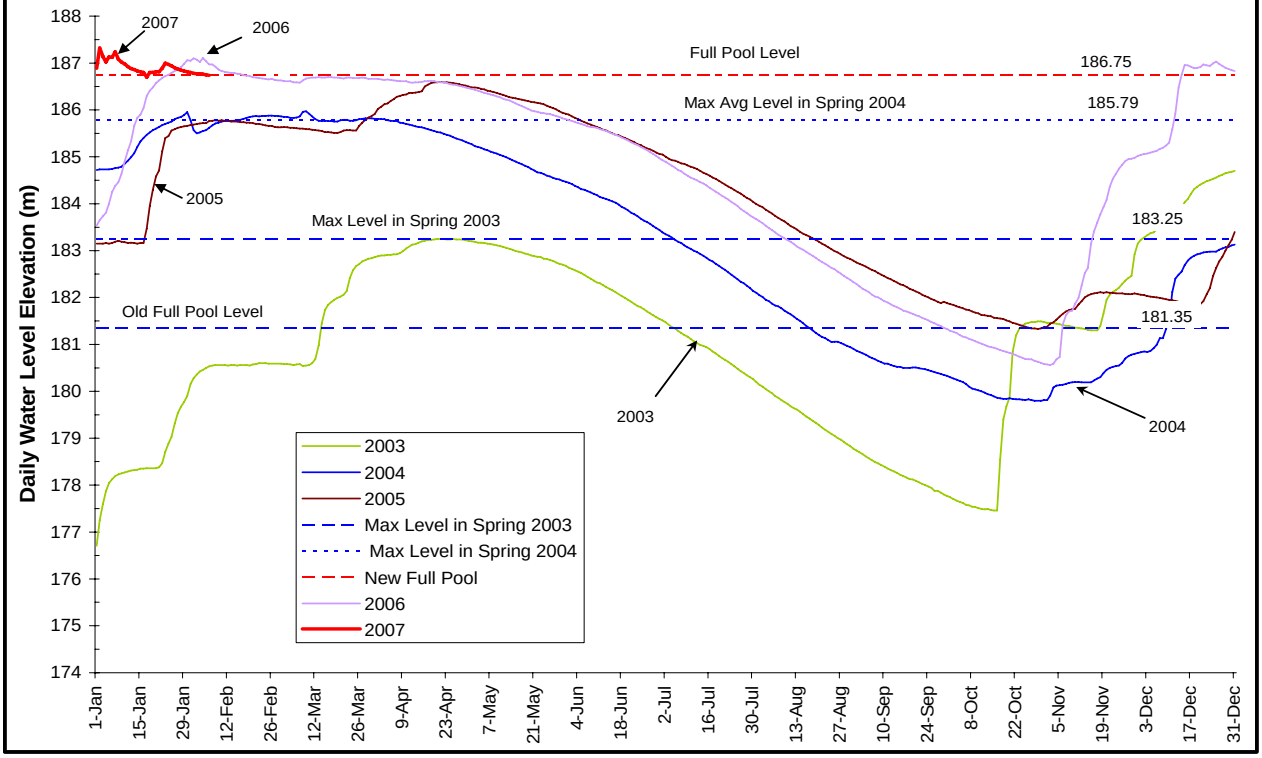

Figure 2. 2007 Temperature of Raw Water entering Japan Gulch Plant (Weekly Average)

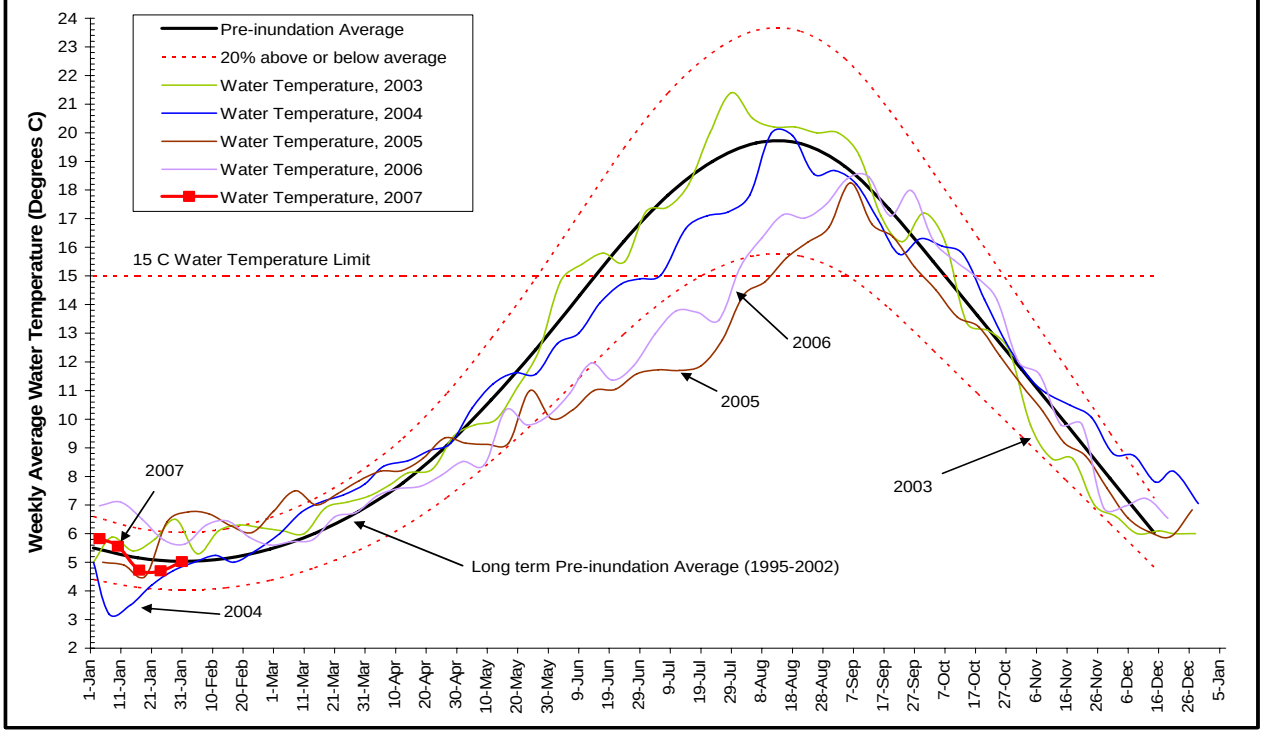

Figure 3. 2007 Turbidity in Sooke Reservoir
North Basin, 1m depth (SOL-04-01)

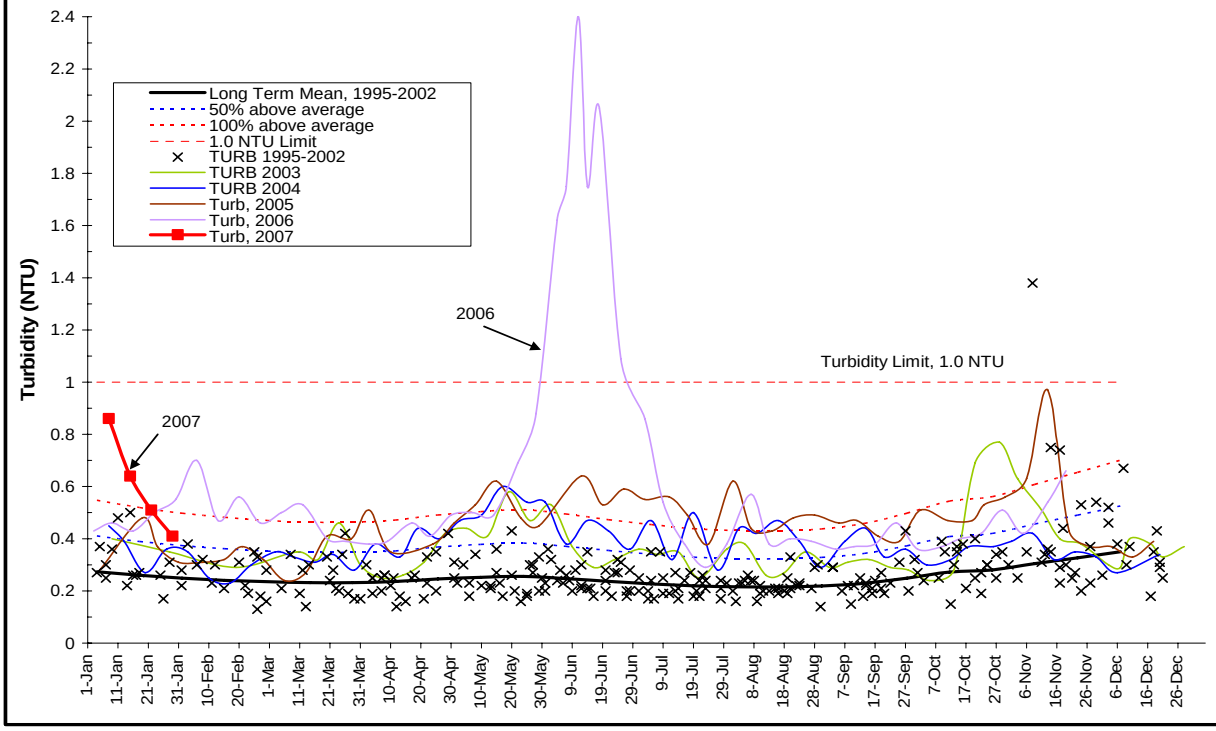

Figure 4. 2007 Water Transparency in Sooke Reservoir
Intake tower, (SOL-00-01)

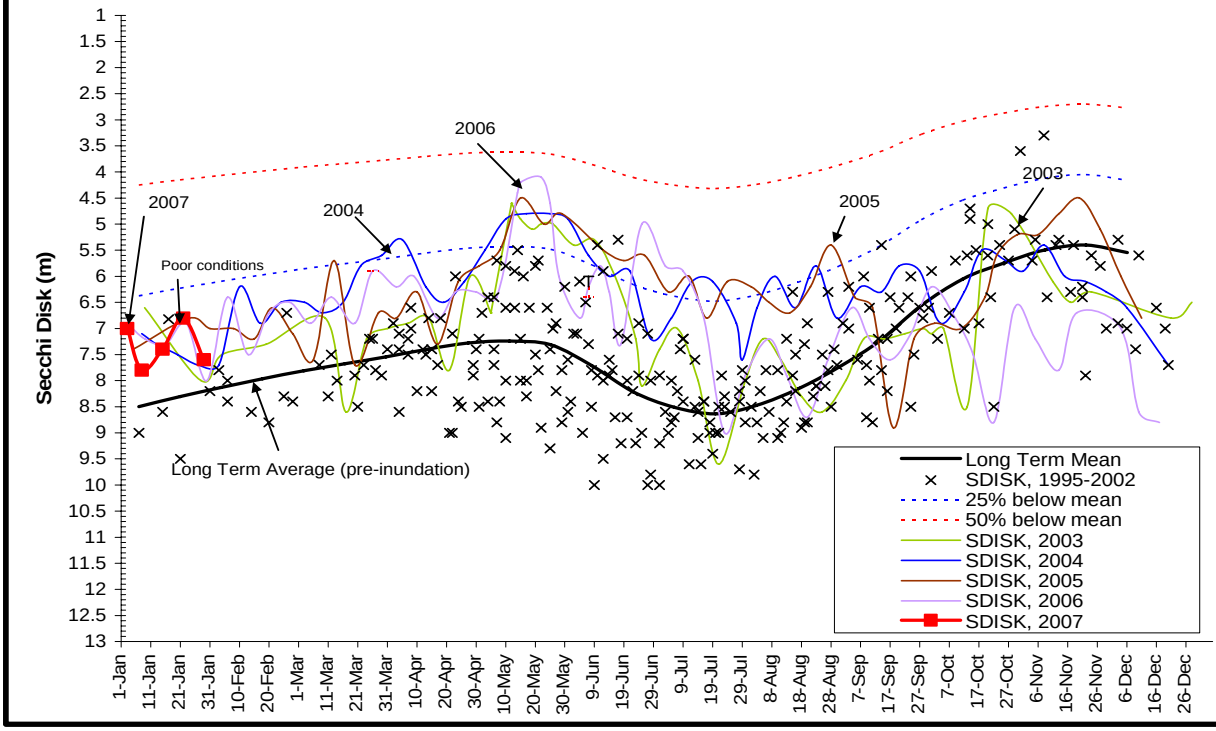

Figure 5. 2007 Total Phosphorus for Sooke Reservoir
South basin, 1 m depth (SOL-01-01)

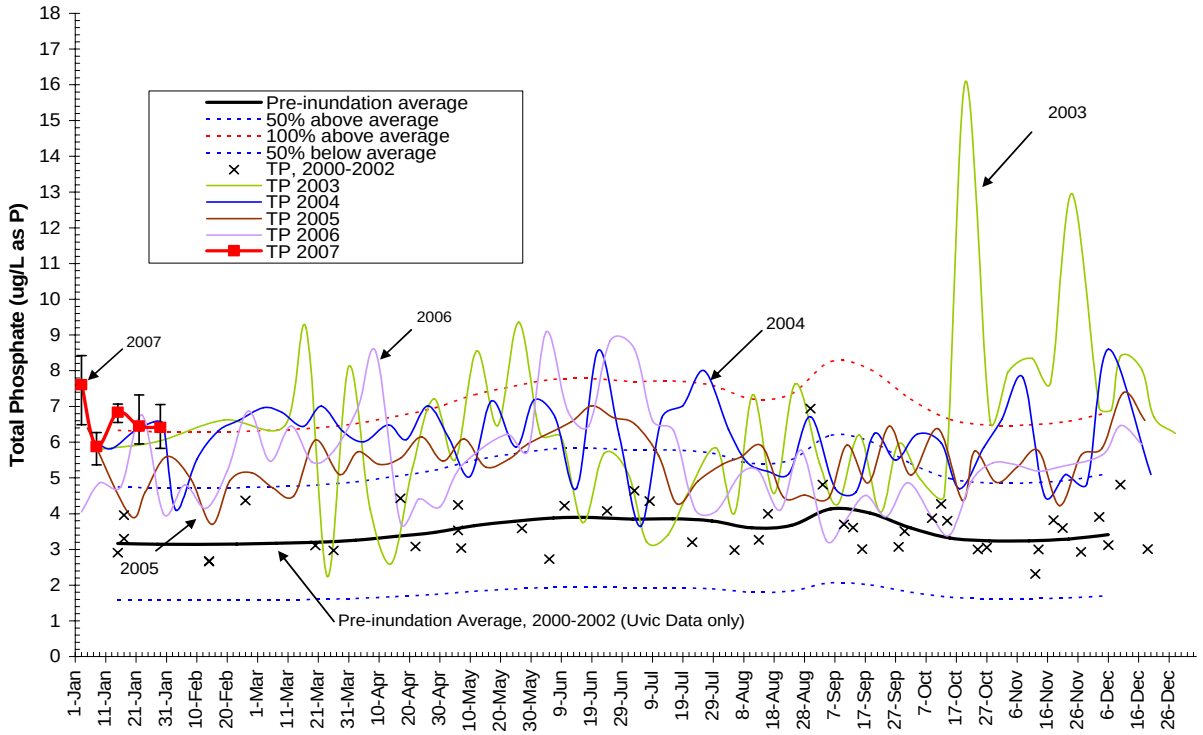

Figure 6. 2007 Total Phosphorus for Sooke Reservoir
North basin, 1m depth (SOL-04-01)

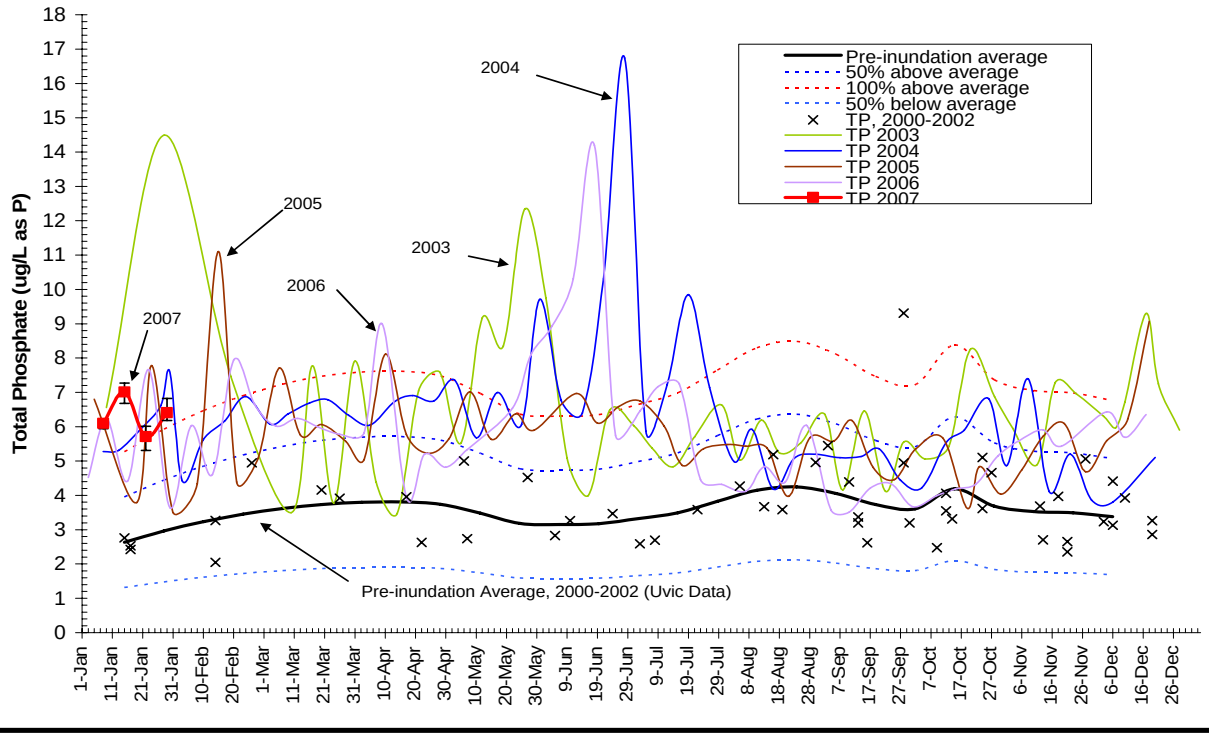

Figure 7. 2007 Total Nitrogen in Sooke Reservoir south basin, 1m depth (SOL-01-01)

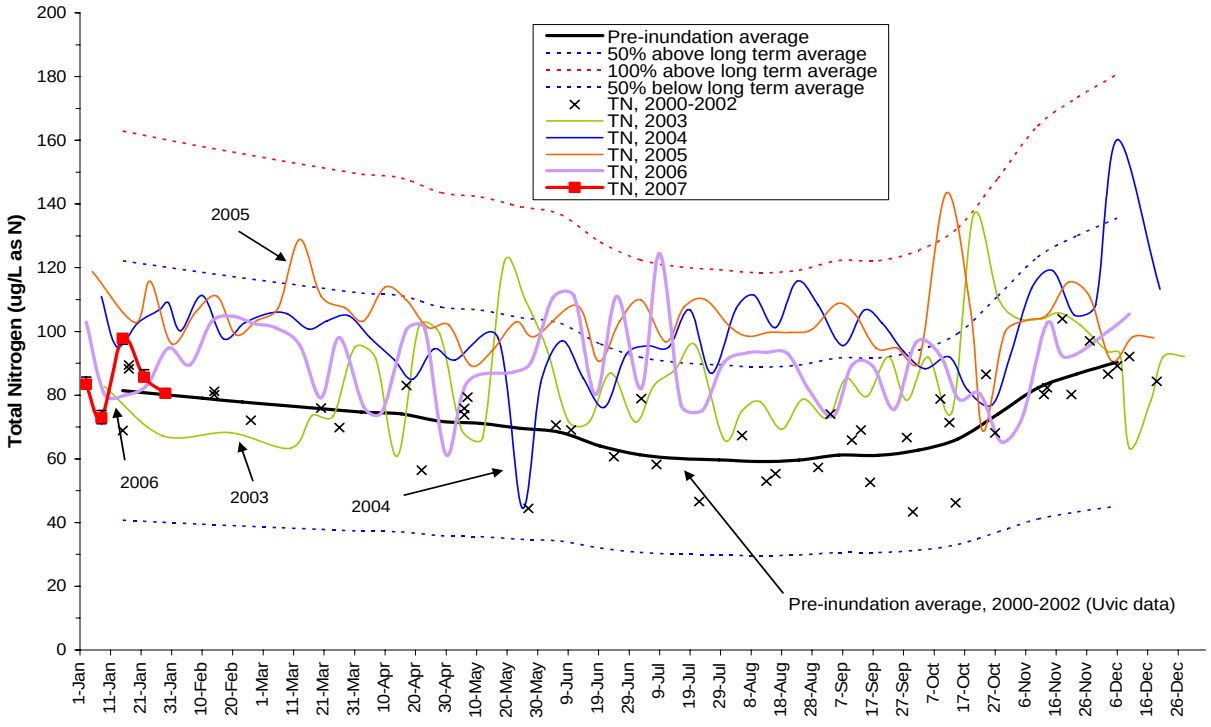

Figure 8. 2007 Total Nitrogen in Sooke Reservoir North basin, 1m depth (SOL-04-01)

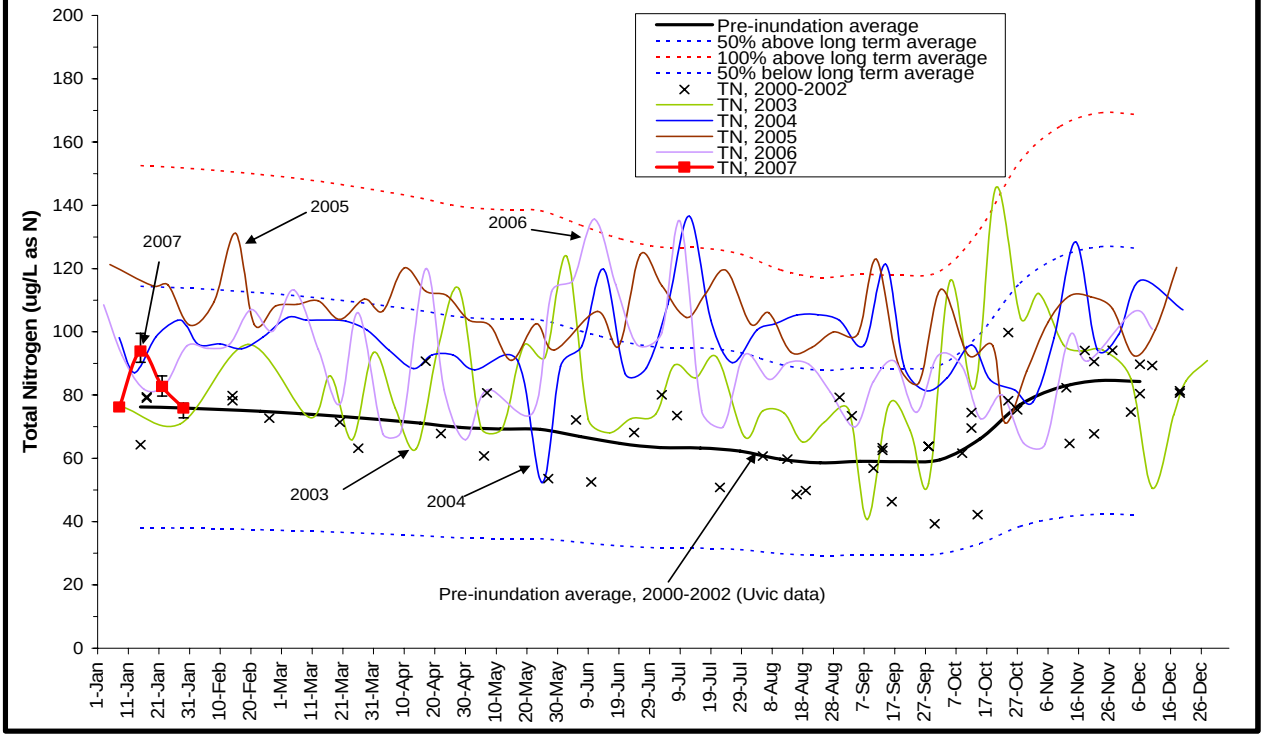

Figure 9. 2007 Chlorophyll-a in Sooke Reservoir
Intake Tower, 1 m depth (SOL-00-01)

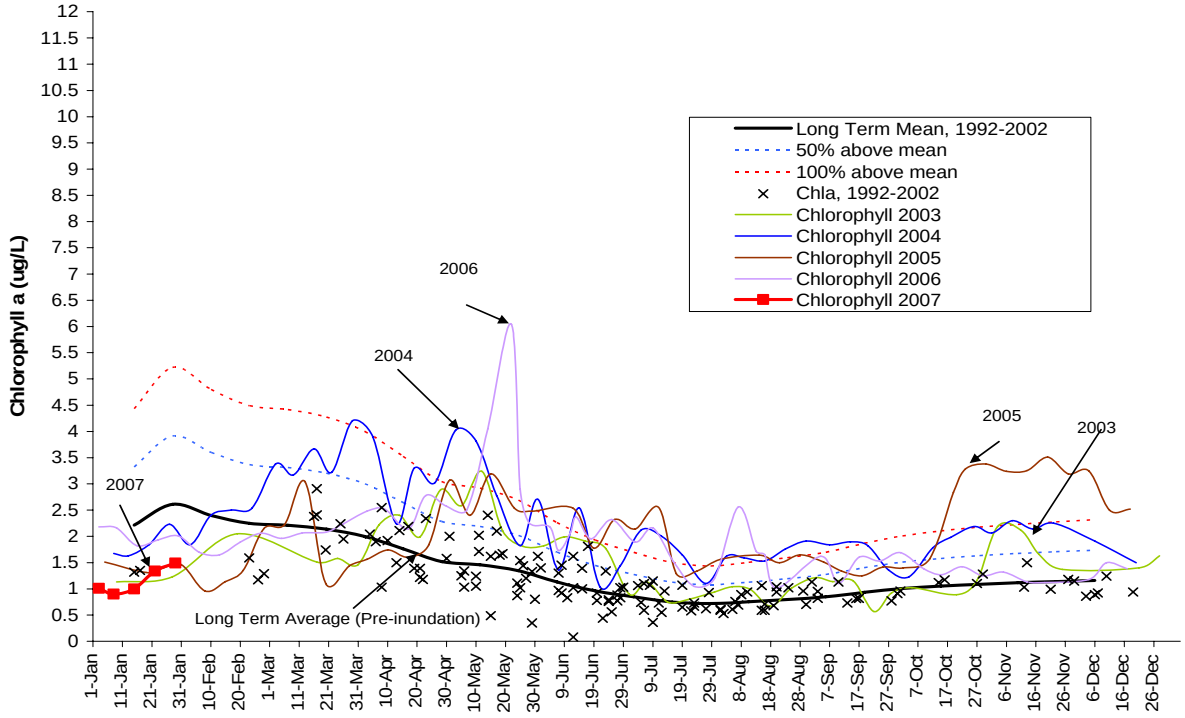

Figure 10. 2007 Chlorophyll-a in Sooke Reservoir
North Basin, 1 m depth (SOL-04-01)