GOULBURN VALLEY WATER
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Information Sheet Dissolved Oxygen

Background

Dissolved oxygen (DO) is the small amount of oxygen gas dissolved in the water. It is essential for the respiration of fish, aquatic animals, micro-organisms and plants. To maintain a healthy and diverse aquatic ecosystem, the dissolved oxygen must be maintained at high levels. If DO falls, there will be reductions or losses in the more sensitive species. At low DO levels, only a very few hardy species may be present. So DO levels are a useful indicator of general water quality.

DO levels in natural waters depend on three factors:-

1. **Speed of uptake of oxygen into the water from air.** This depends on agitation at the water's surface. Shallow flowing streams usually have high oxygen levels while stagnant pools have reduced oxygen.
2. **Speed that oxygen is used up in the water**. Bacteria will use up oxygen in water. If large amounts of organic matter enter the water course from point sources such as sewage plants and animal feedlots, there will be a high bacterial population and so greater oxygen usage.
3. **Photosynthesis of plants and algae**. Aquatic plants and algae release large amounts of oxygen into the water in daylight hours as a by-product of photosynthesis. Peak DO levels occur in early afternoon and minimum levels before sunrise.

Since plants produce oxygen during the day through photosynthesis and use it up at night with respiration, the time of the day when the sample is taken should be kept fairly constant and noted on the record sheet. Oxygen levels are also affected by the temperature of the water. Scientific studies suggest that 4.5mg/L DO is the minimum amount that will support a large and diverse fish population. The DO level in good fishing waters generally averages about 9mg/L. When DO levels drop below about 3mg/L, even the hardy fish die.

Note: A dissolved oxygen test tells us precisely how much oxygen is dissolved in water, but it does not indicate how much DO the water is capable of holding at the temperature of the test. The percentage saturation is a better measure of the availability of oxygen to aquatic organisms.

Sampling Procedure

In slow moving streams, make sure to sample away from the shore and midway between the surface and the bottom. In free flowing streams, any sample taken below the surface will be representative.