

# Water quality monitoring

17.3.1 Please record the results of water quality tests in the table:

Date : \_\_\_\_\_ Time : \_\_\_\_\_

Weather : \_\_\_\_\_ Tester : \_\_\_\_\_

Parameter	Results
Water Temperatures	°C
Salinity	‰
Dissolved Oxygen	mg/L
pH	
Turbidity	(NTU)
Phosphate ( $\text{PO}_4^{3-}$ )	mg/L
Ammonium ( $\text{NH}_4^+$ )	mg/L
Nitrate ( $\text{NO}_3^-$ )	mg/L
Nitrite ( $\text{NO}_2^-$ )	mg/L

17.3.2 Please suggest the possible ways that the general public could help to improve the water quality.

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## Supplementary Information:

### Water Temperature ( °C)

Water temperature poses critical influences on aquatic organisms and other physical parameters in water. Therefore, animals could only live within a specific range of temperature. On the other hand, temperature is in inverse proportion to dissolved oxygen. Higher the temperature, lower the dissolved oxygen. A dramatic change on the water temperature will kill the organism.

### Turbidity (Nephelometric Turbidity Unit)

Turbidity represents the degree of cloudiness of water. The presence of suspended solids such as slits, organic matter, inorganic matter and other pollutants increase the turbidity. High turbidity in water will lower the light intensity underwater. Hence, the rate of photosynthesis of aquatic plant decreases, the amount of dissolved oxygen decrease as well.

Apart from that, suspended solids might clog the gills of aquatic animals.

### Salinity (‰)

The salinity of water in the upper and middle stream is generally low. However, the salinity of estuarine water would be increased as approach the sea. The salinity of estuarine water show seasonal changes, it will be higher in dry season.

### Dissolved Oxygen (mg/L)

Oxygen diffuses in water through the contact surface between air and water. Larger contact area enable more efficient oxygen diffusion. The efficiency of oxygen diffusion will be affected by the water depth as well. Concentration of dissolved oxygen is higher at area with higher water flow rate. Furthermore, oxygen generated by aquatic plants as a byproduct of photosynthesis will increase the concentration of dissolved oxygen in water.

Most aquatic organisms (including plants, animals and microorganisms) need oxygen. Dissolved oxygen will be utilized for decomposition of pollutants and nitrification of ammonia and nitrite. In addition, the amount of dissolved oxygen will be lower under high water temperature and high salinity environment.

Generally, 4 mg/L of dissolved oxygen is the lowest limit for most fishes. Some fishes might struggle to live under that limit, but they will be killed in an environment with less than 1 mg/L of dissolved oxygen.

### pH

Generally, freshwater is neutral or slightly alkaline in Hong Kong. The presence of animals will affect the pH of water. It is because carbon dioxide is released by living organisms will dissolve in water and result in an acidic environment.

When sulphur dioxide released from factories and vehicles react with water in the air, it forms acid rain. The acid rain increase the acidity of stream water. In addition, strong acid or strong base discharged to the stream might change the pH dramatically.



### Phosphorus and Nitrogenous Compounds (mg/L)

Phosphorus and Nitrogen compounds are produced from the metabolic activity of aquatic organism and decomposition of organic matter. Concentration of these compounds are generally low in water in a natural stream. However, fertilizer and animal waste release from cultivated lands and livestock farms might greatly increase the concentration of these compounds. High concentration of Phosphorus and Nitrogen compounds stimulate the growth of algae. Extensive growth of algae increase the turbidity in water, thus lower the photosynthetic rate of submerged plants. At night, algae consume oxygen in water, which lower the oxygen concentration in water.

