



Testing Water Quality

Test Results Interpretation Cards

Odour

Unexpected odours in the water could point to certain types of pollution. Some unusual smells and the possible sources include:

- | | |
|--------------------|--|
| <i>Rotten</i> | – too much decomposing material due to excess fertilizers or sewage waste |
| <i>Oily</i> | – there has been a spill of oil or gas, perhaps caused by runoff from local roads |
| <i>Nail polish</i> | – <i>organic chemicals</i> , perhaps caused by pesticides or herbicides |
| <i>Earthy</i> | – smells like grass, this is not harmful and is usually due to an algae called geosmin |
| <i>Chlorine</i> | – might be an excess of chlorine from water treatment or an industrial spill |
| <i>Rotten egg</i> | – hydrogen sulphide, might be natural or from industrial waste |
| <i>No smell</i> | – while this is a good sign there could still be contaminants that don't smell |

Turbidity or Clarity

If the water is too cloudy, the particles of dirt can block light getting to algae and plants, increase the temperature of the water, or settle and cover fish and insect eggs. The cloudiness of a water sample could indicate various types of contaminants. Most cloudy water is caused by soil erosion or spills of materials. Soil erosion is caused by deforestation or poor farming methods.

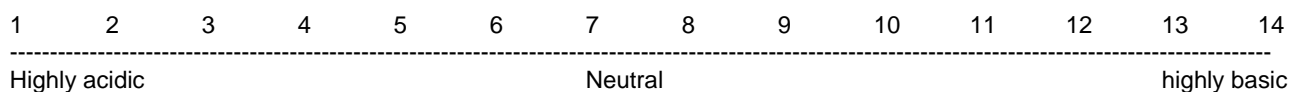
- | | |
|------------------------|---|
| <i>Clear</i> | – healthy water indicator |
| <i>Slightly cloudy</i> | – water quality is probably OK, might indicate there was a recent rain and river sediments were stirred up |
| <i>Cloudy</i> | – indicates a possible upstream source of soil erosion due to deforestation or agriculture and poor water quality |
| <i>Very cloudy</i> | – this is a sign of bad water quality |

Temperature

Warmer water holds less dissolved oxygen so colder water is better for more organisms. Water is kept cool by trees near the edge of the water. If all the trees have been cut down near the shoreline, the water is likely warmer than it should be. It is very difficult to judge if the temperature of your water is healthy without more detailed studies. You will assess the temperature indirectly by observation of the amount of shoreline covered with trees or bushes. Sometimes thermal pollution is caused by warm or hot water discharged from a factory.

<i>A lot of trees</i>	– interpret the temperature as indicating healthy water quality if >75% of the shoreline was covered by trees
<i>Some trees</i>	– interpret the temperature as indicating ok water quality if 40% - 75% of the shoreline was tree covered
<i>Few or no trees</i>	– interpret the temperature as poor water quality if <40% of the shoreline was tree covered

pH



Most sensitive aquatic plants and animals need a pH between 6.5 and 8, close to a neutral 7. If there is limestone in the watershed the pH might be more basic or > 7 . Acid rain caused by sulphates and other emissions from industry smokestacks will have a pH closer to 5.5.

pH 6.6 - 8 - indicates healthy water quality.
pH < 6.5 - is acidic and indicates poor water quality
pH > 8 - is basic and indicates poor water quality

Dissolved Oxygen

All the aquatic plants and animals need oxygen dissolved in water to support life. Salt water, warm water and water at high altitudes holds less dissolved oxygen. Low levels of dissolved oxygen can result from adding extra fertilizers or manure to water. The fertilizers or manure can runoff from lawns, farms or golf courses after a rain. This causes algae to grow rapidly and use the available oxygen. Often other aquatic organisms die and the decomposition requires even more oxygen.

- > 8 ppm – healthy oxygen levels for all types of plants and animals
- 6 – 8 ppm – a few organisms are stressed, ok water quality
- 3 – 6 ppm – growth inhibited, poor water quality
- < 3 ppm – lethal with prolonged exposure, bad water quality

Free Chlorine

Free chlorine in tap water usually ranges in amounts from 0.04 ppm to 20 ppm. Free chlorine in tap water shows that bacteria have been killed and the water is safe for us to drink. The good news is that free chlorine does not last long in water and combines quickly with other elements. The bad news is that small amounts of free chlorine in lake and river water can harm microscopic aquatic life. High levels of free chlorine in rivers and lakes indicate chlorine spilled from industries like pulp and paper, water treatment plants, and bleaching of textiles.

- < 0.01 ppm – healthy chlorine levels for aquatic organisms
- 0.01 – 0.1 ppm – poor water quality that stresses some aquatic organisms
- > 0.1 ppm – bad water quality that is lethal to most aquatic organisms

Phosphates

Phosphates are needed in water at low levels. They are an important nutrient for aquatic plants and animals. Phosphates are found in fertilizers, manure and some detergents. In Ontario, phosphates were banned from laundry detergents in 1993. There is now a discussion about removing phosphates from dishwasher detergents to help keep phosphate levels low in surface water. Another human activity in addition to detergent use that increases phosphates to unhealthy levels is runoff of fertilizers. Natural levels of phosphorus in uncontaminated water are usually below 0.015 ppm.

- < 0.03 ppm – healthy water quality
- 0.03 ppm - 0.1 ppm – poor water quality as the increased phosphate levels lead to excess algae growth
- > 0.1 ppm – bad water quality

Nitrates

Nitrates are needed in water at low levels. They are an important nutrient for aquatic plants and animals. Nitrates enter the water from runoff of fertilizers from lawns, golf courses or farms. Also, decomposing waste or manure runoff contributes nitrates to water. Very high levels of nitrates in humans can limit the ability of red blood cells to carry oxygen. Natural levels of nitrates in uncontaminated streams are usually less than 1 ppm.

- < 4 ppm – healthy water quality
- 10 - 40 ppm – poor water quality
- > 40 ppm – bad water quality