HANOVER-CAROLINE SWCD SOIL & WATER CONSERVATION DISTRICT

We work with the people who work the land.

Water Quality Testing Instructions

- Temperature
- pH
- Dissolved Oxygen
- Nitrate

Hanover-Caroline SWCD
P.O. Box 446
13224 Courthouse Rd.
Hanover, VA 23069
804-537-3009

temperature

Temperature is very important to water quality. Temperature affects the amount of dissolved oxygen in the water, the rate of photosynthesis by aquatic plants, and the sensitivity of organisms to toxic wastes, parasites and disease. Thermal pollution, the discharge of heated water from industrial operations, for example, can cause temperature changes that threaten the balance of aquatic systems.

use of the thermometer

1. Remove the thermometer from protective pouch.
2. Carefully lower the thermometer into the water sample for one minute or until the liquid in the thermometer stops rising.
3. If possible, read the thermometer before removing it completely from the water sample.
4. Record the temperature in C° and F °

pH

pH is a measurement of the acidic or basic quality of water. The pH scale ranges from a value of 0 (very acidic) to 14 (very basic), with 7 being neutral. The pH of natural water is usually between 6.5 and 8.2. Most aquatic organisms are adapted to a specific pH level and may die if the pH of the water changes even slightly.

pH can be affected by industrial waste, agricultural runoff, or drainage from improperly run mining operations.

pH procedure

1. Remove one strip of pH indicator paper from its protective wrapping. Re-wrap the remaining papers and return to storage sleeve in the kit box to keep them clean and dry.
2. Use the pipette to collect 1 mL of the water sample.
3. Carefully squeeze one drop of water sample onto the middle of the pH indicator paper strip.
4. Compare the color change of the paper to the pH color chart to determine the water sample's pH value.
5. Record the result.

dissolved oxygen

Dissolved Oxygen (DO) is important to the health of aquatic ecosystems. All aquatic animals need oxygen to survive. Natural waters with consistently high dissolved oxygen levels are most likely healthy and stable environments, and are capable of supporting a diversity of aquatic organisms. Natural and human-induced changes to the aquatic environment can affect the availability of dissolved oxygen.

Dissolved Oxygen % Saturation is an important measurement of water quality. Cold water can hold more dissolved oxygen than warm water. For example, water at 28°C will be 100% saturated with 8 ppm dissolved oxygen. However, water at 8°C can hold up to 12 ppm of oxygen before it is 100% saturated. High levels of bacteria from sewage pollution or large amounts of rotting plants can cause the % saturation to decrease. This can cause large fluctuations in dissolved oxygen levels throughout the day, which can affect the ability of plants and animals to thrive.

dissolved oxygen procedure

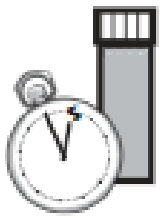
1. Record the temperature of the water sample (see page 28).

2. Submerge the small tube (0125) into the water sample. Carefully remove the tube from the water sample, keeping the tube full to the top.

3. Drop two Dissolved Oxygen TesTabs® (3976A) into the tube. Water will overflow when tablets are added.

4. Screw the cap on the tube. More water will overflow as the cap is tightened. Make sure no air bubbles are present in the sample.

5. Mix by inverting the tube over and over until the tablets have disintegrated. This will take about 4 minutes.



6. Wait 5 more minutes for the color to develop.

7. Compare the color of the sample to the Dissolved Oxygen color chart. Record the result as ppm Dissolved Oxygen.

Locate the temperature of the water sample on the % Saturation chart. Locate the Dissolved Oxygen result of the water sample at the top of the chart. The % Saturation of the water sample is where the temperature row and the Dissolved Oxygen column intersect.

For example: if the water sample temperature is 16°C and the Dissolved Oxygen result is 4 ppm, then the % Saturation is 41.

% saturation

Dissolved Oxygen

Temp°C	0 ppm	4 ppm	8 ppm
2	0	29	58
4	0	31	61
6	0	32	64
8	0	34	68
10	0	35	71
12	0	37	74
14	0	39	78
16	0	41	81
18	0	42	84
20	0	44	88
22	0	46	92
24	0	48	95
26	0	49	99
28	0	51	102
30	0	53	106

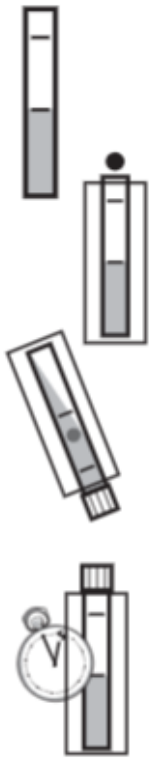
nitrate

Nitrate is a nutrient needed by all aquatic plants and animals to build protein. The decomposition of dead plants and animals and the excretions of living animals release nitrate into the aquatic system. Excess nutrients like nitrate increase plant growth and decay, promote bacterial decomposition, and therefore, decrease the amount of oxygen available in the water.

Sewage is the main source of excess nitrate added to natural waters, while fertilizer and agricultural runoff also contribute to high levels of nitrate.

Drinking water containing high nitrate levels can affect the ability of our blood to carry oxygen. This is especially true for infants who drink formula made with water containing high levels of nitrate. **You should always have a professional lab test your drinking water for the presence of nitrate.**

nitrate procedure

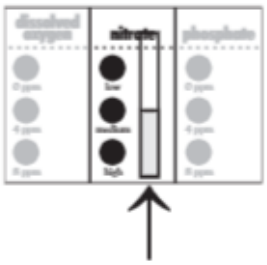


1. Fill the test tube (0106) to the 5 mL line with the water sample.

2. Add one *Nitrate Wide Range CTA TesTab (3703A). Immediately slide the test tube into the Protective Sleeve (0106-FP).

3. Cap and mix by inverting for two minutes to disintegrate the tablet. Bits of material may remain in the sample.

4. Wait 5 minutes for the red color to develop. Remove the tube from the Protective Sleeve.



5. Compare the color of the sample to the Nitrate color chart. Record the result as ppm Nitrate.

NOTE: Nitrate Wide Range CTA TesTabs (3703A) are sensitive to UV light. The Protective Sleeve (0106-FP) will protect the reaction from UV light. If testing indoors, there is no need to use the Protective Sleeve in this procedure.