



310 S. Main St. • Bellefontaine, OH 43311  
PH: 937.592.9040 • FX: 937.592.6746

## **Water Quality**

**By: Lori J. Barnes**

### **Water Resources in Logan County**

Water is one of the most vital resources residents of Logan County rely on. The county's population of around 46,000 is predominantly rural and approximately 49 percent of households rely on groundwater for their water supply. Logan County's primary groundwater source is the carbonate aquifer composed of limestone and dolomite bedrock. Limestone is comprised of calcium carbonate, while dolomite is composed of calcium and magnesium carbonates. Together they form a popular construction material that most Ohioans refer to as limestone.

### **The Hydrological Cycle**

An average of approximately 36 inches of precipitation falls in Logan County annually. Of this, about 9 inches becomes runoff, which moves immediately to surface-water bodies like streams and lakes.

Two inches are retained at the ground surface and evaporate back to the atmosphere. Around 26 inches enter the soil surface through infiltration and 20 of the 26 inches go into soil storage and later return to the atmosphere by the combination of evaporation and transpiration (evapotranspiration). The remaining 6 inches of water has the potential to recharge the groundwater supply. Two of the six inches eventually move to springs, lakes or streams as ground-water discharge. The remaining 4 inches either return to the atmosphere by evapotranspiration or are withdrawn to supply water needs. This process is part of the hydrological cycle.

### **Non-Point Source Pollution**

Natural processes and human activities affect the quality of our water supplies. Throughout Ohio, various human activities can contribute to what scientists call Non-Point Source Pollution. Non-Point Source pollution is the introduction of impurities into a surface-water body or an aquifer, usually through a non-direct route. The majority of the sediments, nutrients, acids and salts, heavy metals, toxic chemicals and pathogens enter this way and affects both ground and surface water. Examples of Non-Point Source pollution include runoff from parking lots, runoff and drainage from agricultural fields, runoff from home gardens and from domestic waste disposal.

### **Ways to Prevent Contamination**

There are a number of things residents of Logan County can do to prevent contamination of our water supplies. By beginning to take a close look at practices around your house that might be contributing to polluted runoff, will help you become part of the solution rather than part of the problem of Non-Point Source Pollution.

### **Household Chemicals**

- Be aware that many chemicals commonly used around the home are toxic. Select less toxic alternatives.
- Buy chemicals only in the amount you expect to use
- Take unwanted household chemicals to hazardous waste centers, do not pour them down the drain. Pouring chemicals down the drain may disrupt your septic system and can cause failure.
- Never pour unwanted chemicals on the ground. Soil cannot purify most chemicals and can contaminate runoff
- Use water-based products whenever possible

### **Landscaping and Gardening**

- When landscaping your garden, select plants that have low requirements for water, fertilizers and pesticides
- Cultivate plants that discourage pests.
- Preserve existing trees and plant trees and shrubs to help prevent erosion and promote infiltration of water into the soil.
- Use grass swales (low areas in the lawn) to increase infiltration and decrease runoff
- Install wood decking or bricks instead of impervious cement walkways.
- Install gravel trenches along driveways or patios to collect water and allow to filter into the ground.
- Restore bare patches in your lawn
- Grade all areas away from your house at a slope of 1 percent.
- Leave grass clipping on your lawn so that nutrients are recycled instead of going to landfills
- Compost your yard trimmings
- Spread mulch on bare ground to help prevent erosion and runoff.
- Test your soil before applying fertilizers so over fertilization does not occur.
- Keep storm gutters and drains clean of leaves and yard trimmings.

### **Septic System**

- Inspect your septic system annually and switch beds to prolong the life of your leach field.
- Pump your septic tank regularly
- Do not use septic tank additives. There is no scientific evidence that biological and chemical additives aid or accelerate decomposition in septic tanks.
- Do not divert storm drains or basement pumps into septic system.
- Avoid or reduce the use of your garbage disposal.
- Do not use toilets as trash cans. Excess solids may clog your leach field and necessitate more frequent pumping.

### **Recycle**

- Recycle used oil and antifreeze by taking them to service stations and other recycling centers. Never put used oil or other chemicals down storm drains or drainage ditches (1 qt. of oil can contaminate up to 2 million gallons of drinking water).

### **Implement Best Practices on Agricultural Fields**

Agricultural runoff contains pollutants including nutrients, sediment, animal wastes, salts and pesticides. Many practices can be used to control runoff and reduce erosion and transport of sediment from agricultural fields. These include:

- Conservation Tillage- includes any tillage or planting system that contains at least 30 percent of the soil surface covered by residue after planting to reduce soil erosion by water or wind.
- Stream bank fencing- to prevent animal waste from entering streams
- Filter strips- established between a pollution source and a water body remove pollutants in runoff. These buffers vary in width and can be designed as a vegetated filter strip, a wetland or riparian.

### **Wellhead Protection**

Proper well construction materials and techniques are essential to providing both a long term and safe supply of groundwater for household use. Any time you construct or service a well the work should be done by a State of Ohio registered Private Water Systems contractor. A poorly constructed well can provide a direct path for contaminants at the surface to migrate into the groundwater. Slope the area around the well so that surface runoff drains away from your well. Also, provide a sealed well cap or sanitary seal to prevent unauthorized use of or entry into the well. In addition, the isolation distances from sources of contamination of a new well that meet all applicable regulatory requirements is essential for inhibiting contaminants from reaching your water supply. Here are some minimum isolation distances:

- ✓ Sewers and drains constructed with watertight pipe= 10 feet
- ✓ Underground Fuel Tanks= 50 feet
- ✓ Septic tanks and absorption fields= 50 feet
- ✓ Leaching pits and leaching privies= 100 feet
- ✓ Vault privies= 50 feet
- ✓ Stables and manure piles= 50 feet
- ✓ Streams, lakes and ponds= 25 feet
- ✓ Properly sealed wells= 10 feet
- ✓ Structures= 10 feet
- ✓ Above ground tanks= 25 feet

### **Abandoned Wells**

An unused or abandoned water well is that is no longer in service or is in such a state of disrepair that continued use for the purpose of accessing ground water is unsafe or impracticable.

Abandoned wells can be found almost anywhere: on farms, industrial sites, and in urban areas. Those marked by windmill towers and old hand pumps are easy to spot. Many lie hidden beneath weeds and brush. These wells are often abandoned when their yield has diminished, or the quality of the water they supply has degraded. The number of potential contaminants that may enter these wells is unlimited. Fuel, fertilizer, solvents, sewage, animal waste, pesticides and numerous other contaminants have been introduced into ground water through improperly sealed abandoned wells. Any well to be abandoned should be sealed to prevent contamination. Abandoned wells are often preferred havens for a host of arthropods (spiders, earwigs, and centipedes) that prefer dark, moist, calm places. Also these can

become subsurface dwellings for rodents and reptiles. The bodies and waste products of these colonists add nutrients and undesirable bacteria to the groundwater.

Grout and seal unused wells on your property as they are likely to be linked to your present water supply and can potentially cause contamination.

### **What is Coliform Bacteria?**

It is extremely important to have your water tested annually for bacteria.

Coliform bacteria originate as organism in soil or vegetation and in the intestinal tract of warm-blooded animals (fecal coli). This group of bacteria has long been the preferred indicator of the contamination of water and possible presence of intestinal parasites and pathogens.

The many sources of bacterial pollution include runoff from woodlands, pastures, feedlots, septic tanks and from animal and wildfowl. The most likely sources are where the water is used. The spigot and sink, or unclean containers. A really common source is backflow from a contaminated source. It is important to keep the plumbing system clean to maintain a sanitary water supply. Each time work is done on the plumbing or pump, the entire water system should be disinfected with chlorine. By simply pulling the pump out of the well and setting it on the grass is enough to contaminate the well with bacteria.

Most coliform bacteria are harmless residents of the soil and will not make people sick. Some strains of *E. coli*, the most common fecal coliform bacterium may be pathogens and should be taken seriously. If you have unsafe levels of coliform bacteria you should obtain an alternative source of drinking water and cooking water until the well has been properly chlorinated and a safe sample taken. Instructions on how to properly chlorinate you well can be downloaded from our website or picked up at the Logan County Health District.

If you have *E. coli* in your well, do not use the water for any consumption purposes and an inspection should be done of your water system by a sanitarian at the Health District to determine if there are visible indicators of surface contamination. A dye test should also be performed on your well to determine if improper grouting has caused surface contamination to occur in the well.

If no dye is detected, a representative from the Ohio Department of Health will perform a down hole camera inspection of your well casing to check for possible construction deficiencies that may be causing contamination. The well should be abandoned properly and a sealing report submitted to Ohio Department of Natural Resources, Division of Water and a copy submitted to the Logan County Health District.