

# Water and Watershed Information

## Water appearance

Water appearance is often the most obvious water quality indicator that people notice. However, it is not a precise indicator of stream health and is best considered in combination with other data you will collect. Healthy streams may range from clear to brown. Unhealthy streams are often crystal clear. The following are common stream colors and possible causes.

**Clear** – Usually associated with healthy waters. However, clear waters may be polluted with colorless substances. Very clear water without any living organisms may indicate a severe pollution problem.

**Multi-colored sheen** – A heavy sheen may indicate floating oil from dumping or run-off from sewers, roads and parking areas. A light sheen may result from the natural breakdown of vegetation. Iron oxidizing bacteria also produce

**Foamy** – If foam is fairly thin – less than 6 inches high – and grayish it may be the result of natural oils, soil particles and pollen. Heavy foam (more than 6 inches off the surface of the water) may be the result of detergents or animal waste runoff.

**Muddy / Cloudy** – May result from high amounts of sediment and indicate erosion upstream. Consider stream type and location, amount of sediment, recent storms, or seasonal events such as snowmelt.

**Brown** – Often results from decaying organic matter in the stream. Streams that drain wetlands may be stained a very dark brown.

**Green** – Slightly greenish water results from the presence of microscopic plants or algae and usually indicates healthy conditions. Deep green, or pea soup color, often results from an overabundance of algae (phytoplankton). Heavy nutrient loads from fertilizers (agriculture, golf courses, lawns), animal waste (feeding operations) and poor sewage treatment often promote heavy amounts of algae.

**Orange / Red** – May indicate runoff from mines or oil wells; may result naturally from drainage through soils rich in iron or tannins.

**Milky** – This color may indicate pulp or paper manufacturing discharge, a dairy operation or natural sediments.

**Scummy** – May result from floating algae or decaying plant material.

**Other** – What other colors do you see? Be specific.

## Water Smell

Smell is another useful, but limited, tool that should be considered in combination with other indicators. Below are some common smells that result from both healthy and unhealthy waters.

**Sulphurous (rotten egg)** – A sulphurous smell which often indicates sewage or animal waste pollution. Anaerobic (without oxygen) decomposition processes and minerals delivered from sulphur springs also give off this smell.

**Chlorine** – May result from heavy chlorination of treated sewage.

**Sewage** – May indicate raw sewage

**Petroleum** – May indicate influx of oil (point or non-point contamination).

**Chemical** – May indicate influx of chemicals (point or non-point contamination)

**None** – no distinct smell

**Other** – Smell another odor? Make a note.

## Land Use around the Sampling Site

Land uses around your stream and throughout your watershed can have both positive and negative effects on your water quality.

**Factories** – Industrial facilities and others may represent a direct, or point-source of pollution. Point source pollution can be sewage, chemicals or heated water.

**Pavement** – Paved surfaces and roof tops (malls, stores, parking lots) don't allow water to infiltrate into the soils. Pollutants on these surfaces (oil, antifreeze, sediment) often wash directly into streams.

**Agriculture** – Farm lands have the potential to deliver sediment, nutrients and pesticides to streams. Some irrigation practices in areas such as the Colorado River Basin wash salts from the soil and increase salinity levels in rivers and streams.

**Logging** – Silvicultural activity (logging) often increases runoff and sediment and nutrient supply to the stream.

**Grazing** – Overgrazing can potentially deliver organic matter and nitrates to the stream. Excessive grazing of the riparian zone may damage vegetation, causing increased erosion and loss of shading by woody plants.

**Homes** – Fertilizers and pesticides applied to lawns often find their way into local streams during rain storms. Faulty septic tanks may increase bacteria levels and nutrients in streams. Oil and household chemicals are other common impacts.

**Mining** – Various forms of mining may lower pH, increase heavy metal concentrations and sediment loads, and decrease streamflows.

**Coal Bed Methane** – Water discharged from coal bed methane extraction can have higher salinity and sodium levels.

**Recreational**– Unpaved roads and associated road cuts and trails created by off-road vehicles can be significant sources of sediment to streams.

**Wildlands** – Healthy, well-vegetated woodlands and fields stem the flow of nutrients and organic matter to streams.

**Waste treatment plants** – Plants that treat sewage and other polluted water often release water containing high concentrations of nutrients.

## Present Upstream

**Irrigation diversion**– diverting water from a stream to be used for irrigation reduces discharge

**Road crossings**- culverts can influence stream flow and velocity

**Dam**– influences stream discharge and velocity

**Irrigation return**– water returning to a stream from agricultural areas can influence the chemical composition discharge and velocity

**Point Sources of Pollution:** pollution resulting from discharges into receiving waters from any discernible confined and discrete conveyance such as a pipe, ditch or sewer.

**Non-Point Sources of Pollution:** pollution sources that are diffuse and do not have a single point of origin. Examples include run-off from agriculture, forestry and construction sites.

**Channelization**– straightening of stream channels can result in changes to velocity

**Beaver dam**– influences stream discharge and velocity

**Fish migration barriers**– impedes ability of fish to move upstream

**Fish habitat structures**– affect types of fish found in stream

**Other**– list unnamed structures upstream that could influence stream flow