

Guide to identifying possible pollutions

This guide will help you to decide if you should report a case of likely sewage/pollution or if what you have observed is a naturally occurring event that happens to look (and smell) like sewage.

The South West has some of the finest beaches and inland waterways in Europe. However, every year many mistaken cases of pollution are reported, both in freshwater areas (such as lakes and rivers) and coastal waters, that are in fact the breakdown of algal blooms.

It's easy to mistake algae for sewage, particularly as both have an unpleasant smell, but if you notice foam on the sea or beach, or if freshwater has a blue-green/green colour it's more likely to be the result of an algal bloom breaking down.

In short, most naturally occurring algal blooms do *not* need to be reported as a pollution. The types of true sewage/pollution that *should* be reported are described further down this guide.

Algae

What is algae?

Algae are naturally occurring microscopic plants which form the base of the food chain and so are vital for the natural health of our waters. Although there are many different species of algae only a few may be toxic.

You can't tell if an algal bloom in the sea, lake or river is toxic just by looking at it, so it's safest to assume it is and avoid contact with the water or algae.

Both **freshwater algae** and **marine algae** exist. Freshwater algae are found growing underwater on rocks and mud in streams and rivers whereas marine algae grow in the sea and oceans.

Below are two types of naturally occurring algal blooms and do *not* need to be reported as pollutions.

Blue-green algae (freshwater)

In freshwaters, particularly lakes, blue green algae (*cyanobacteria*) have the potential to be harmful by forming blooms and scums which can be highly toxic to humans and animals.

This algae becomes visible when it starts clumping together in the water. Some examples are shown below.



Blue-green algae & dead fish (Image: Kirsten Macintyre, Flickr)



Blue-green algae (Image: Michael John Button, Flickr)

It can appear in different ways in the water:

- can turn water cloudy and give it a green, blue-green or greenish-brown appearance
- can form green or blueish scum, often on lakes, which can gather along the shoreline and look like sewage pollution (like paint, jelly or foam)
- may look like blue or green paint has been poured into the water
- can clump together to look like seaweed or brown clumps amongst other water weeds
- may appear as green sawdust or brown pinheads

Marine algae (Sea Foam)

Marine algae can affect our coastline and shores, especially after windy conditions following warm weather.

The most common algae in British coastal waters is a non-toxic type called *Phaeocystis*. Throughout the summer months, this forms clouds of 'frog spawn' like colonies, sometimes mistaken for oil drops in the water which can grow rapidly into large blooms.

It is when the bloom starts to break down (as the algae dies) that their appearance and smell may be mistaken for sewage. Creamy-brown foam can form on the water's surface and if near cliffs or rocky headlands, the foam may appear as thin layers or lines caused by the action of the waves.



Typical layer of creamy-brown foam (Image: South West Water)



Waves around headland causing lines of foam (Image: South West Water)

In some cases these blooms can form thick blankets alongside the shoreline.



Wind blown sea foam on seashore



Sea foam washed on to seafront by rough seas (Image: South West Water)

Although non-toxic, the smell of bad eggs or rotten vegetables is associated with the algae's breakdown which can be mistaken for sewage smells. Any brown discolouration is often sand or silt trapped in the foam.

It can also become mixed in with rotting seaweed (itself sometimes mistaken for sewage – see ‘Seaweed’ section lower down):



Sea foam and seaweed in harbour (Image: South West Water)



Sea foam and seaweed in sea shallows (Image: South West Water)

Key differences between algae and sewage at the coast

If you notice foam on the seawater’s surface or on the beach, it is very unlikely to be sewage. To help you tell the difference, the following guidelines may help:

- Algal blooms generally occur between April and August so foams are likely to be due to the natural breaking down of algae between these dates.
- Long lines of algal foam, seen off headlands or lying parallel to the coast, will have no real point of origin on the shoreline.
- Stormwater overflows tend to cause a grey discolouration of the water and often have a clearly identifiable source, such as a pipe or outfall, where the discolouration is strongest.
- Treated sewage discharges and stormwater overflows very rarely form foam or scums on the water surface (however, washing powders and detergents can cause localised foaming around discharge pipes, but *not* long lines or thick blankets of foam).
- Sewage discharges can contain fats and oils causing waves to flatten around it and sometimes attract flocks of seabirds.

Rotting Seaweed

Although it is naturally occurring, seaweed can also sometimes be mistaken for sewage, particularly with the smell of bad eggs or rotten vegetables associated with accumulations of decomposing seaweed on the beach, especially in warm weather.



Dry rotted seaweed on rocks (Image: South West Water)



Rotting seaweed exudate (Image: Rosser1954 Wikipedia)

Run-off

Surface run-off occurs when there is excessive precipitation (heavy rain, storms, etc) on to ground that is already saturated or impervious surfaces such as roads. If run-off happens before reaching a channel or drain then this can cause pollution as the water picks up and carries man-made contaminants into our rivers, lakes and seas.

Agricultural run-off (below left) is the biggest polluter of rivers and other waterways in the UK as it often carries along pesticides, fertilizers and animal slurry which can kill fish and plants.

Urban run-off from roads and towns can carry pollutants like oil, diesel and petrol or the residue from tyres and brakes, into rivers and canals (no image).

Not all run-off incidents will necessary contain pollutants. Sometimes it is simply muddy surface water (below right) washed off (non-polluted) land flowing into streams or on to beaches following heavy rainfall.



Agricultural run-off after heavy rain (Image: Lynn Betts, NRCS)



Muddy run-off water entering sea (Image: Ruth Hartnup, Flickr)

Sewage / Pollution

What is sewage wastewater?

The term 'sewage' really refers to 'blackwater' (or sewage wastewater) and refers to the raw sewage that comes from homes, schools and businesses. It consists of fecal matter, urine, toilet paper, wet wipes, sanitary products and anything else that is disposed of in a toilet. It is the most hazardous form of wastewater, containing pathogens, including bacteria, viruses, and parasites.

'Greywater' is non-sewage wastewater that comes from sinks, dishwashers, washing machines, baths and showers (soaps, detergents, food particles, hair). It contains lower levels of contamination than blackwater.

Pollution observations that should be reported

Below are descriptions of the types of pollution events that ***should be reported***.

Human waste and sewage solids

The term "human waste" or "sewage solids" is used in the general media to mean several things such as sewage, sewage sludge, blackwater - in fact anything that may contain some human faeces. In the stricter sense of the term, human waste is in fact human excreta, i.e. urine and faeces, with or without water being mixed in.



Sewage solids (Image: South West Water)

Wet wipes, toilet paper, other sanitary products (RAG)

'Rags' (above right) is the sewer utility term for fibrous materials that don't break down after being flushed down your plumbing.

Wet wipes are one of the most common litter items we find on UK beaches. Wet wipes and other sanitary items like pads and tampons end up on our beaches and in the environment as they're often mistakenly flushed down the toilet.



RAG sewage (Image: South West Water)

Grey / cloudy / milky coloured water / Soap suds

Pollution is often caused by misconnections in the sewage wastewater system where incorrect plumbing can cause foul water from a bathroom, kitchen or utility room to enter a surface water system and then entering rivers or streams instead of making its way to a treatment plant.



Grey coloured water (sewage smell) (Image: South West Water)



Detergent causing soap suds (Image: Ayrshire Rivers Trust)

Sewage wastewater that originated from toilets is usually a grey/cloudy colour (above left) and will have a distinct sewage smell. Sewage wastewater that comes from laundry or washing up usually results in more milky coloured water (no image), potentially with a fragrant smell of washing powder or detergent. White foam or soap suds could also be present (above right).

Grey 'sewage fungus' (below) may also be visible in any sewage wastewater, caused by a grey feathery build up of filamentous bacteria. Again, this is often caused by pipe misconnections or farm waste running into the watercourse.



Sewage fungus (Image: Jürgen Mages; Wikipedia)

Dead or gasping fish

If you see large numbers of fish in distress or dead in waterways, it is most likely caused by a pollution event. Fish depend on oxygen in the water to survive and so anything that causes a drop in oxygen levels will cause fish and other marine life to literally gasp for air & potentially die.

Pollutions that affect water toxicity and harm aquatic life include sewage discharges, oil or hazardous waste/chemical spills, agricultural runoff and even poaching with chemicals. Clues to what has caused fish deaths may sometimes be obvious from the colour & smell of the water.



Dead fish at edge of lake (Image: South West Water)

Traces of petrol, diesel or oil

Although there are natural sources of oil, often a rainbow coloured, oily sheen on a water surface is a sign that petroleum or other oils have entered the river or waterway.



Petroleum sheen on water (Image: Steve Snodgrass, Flickr)