

ENVIRONMENTAL Fact Sheet



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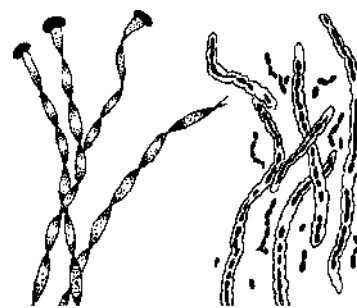
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Iron Bacteria in Surface Water

What are iron bacteria?

At least 18 types of bacteria are classified as iron bacteria, long thread-like bacteria that “feed” on iron and secrete slime. Unlike most bacteria, which feed on organic matter, iron bacteria fulfill their energy requirements by oxidizing ferrous iron into ferric iron. When ferrous iron is converted to ferric iron, it becomes insoluble and precipitates out of the water as a rust-colored deposit. Once the cells begin to decay, they release a reddish or brownish slime material. This process can occur simply by exposing iron-rich groundwater to the atmosphere. Slimy and clumpy deposits are likely caused by iron bacteria.



Two species of iron bacteria

<http://dnr.wi.gov/org/water/dwg/images/bact.gif>

Are iron bacteria harmful?

Iron bacteria are of no threat to human health. They are found naturally in soils and water in low numbers and will thrive as more iron becomes available. However, the orange slime in the water or leaching from the shore is often considered to be an aesthetic problem. The oily sheens created by the decomposing bacteria cells are often mistaken for petroleum sheens.

What causes iron bacteria?

Iron is a common element in New Hampshire soils. Consequently, iron-fixing bacteria have existed in our natural waters for over a million years. Iron-rich fill material or bedrock can create an iron bacteria problem whenever it is located near water. In general, wherever there is oxygen, water and iron there is the potential for an iron bacteria problem.

How can we identify iron bacteria?

Orange or brown slime (precipitate) and oily sheens (decomposing bacteria cells) are often the first indication that these bacteria are present. Unlike petroleum sheens the iron bacteria sheens break apart when they are disturbed. The orange or brown slime may be collected in a jar and analyzed microscopically at DES to identify the bacteria type.

What can we do about iron bacteria?

The best treatment for an iron bacteria problem is prevention. To thwart these obnoxious bacteria, have all fill material analyzed for iron content before using or exposing it. Unfortunately, once established, iron bacteria problems are difficult, if not impossible to correct. Sometimes iron-rich fill can be replaced by fill with lower iron content. However, this may be extremely costly and have other environmental impacts.

For further information: For more information on iron bacteria, please contact DES's Biology Section, (603) 271-3503, www.des.nh.gov