

Acid Sulfate Soils

Acid sulfate soils are those soils in which sulfuric acid may be produced, is being produced, or has been produced in amounts that have a lasting effect on the main soil characteristics.

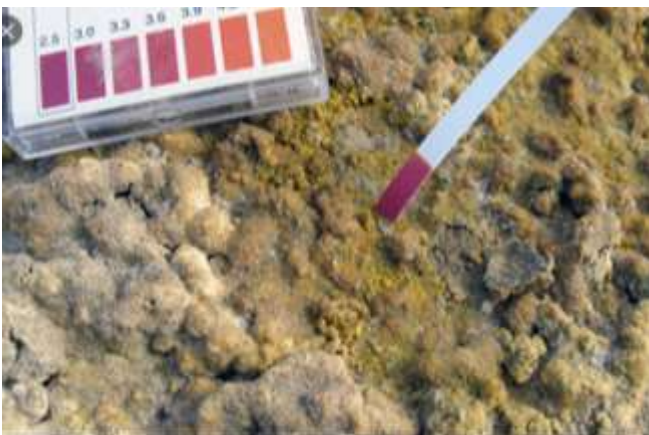
(Potential) acid sulfate soils occur naturally in both coastal and inland settings where waterlogged conditions with sufficient organic matter and iron sulfates (pyrite) are, or have been, present.

What are Acid Sulfate Soils?

Acid sulfate soils are natural sediments that contain iron sulphides and are common along the NSW coast. Acid sulfate soils are safe and harmless when not disturbed.

However, if the soils are drained, excavated or exposed to air by a lowering of the water table, the sulfides react with oxygen to form sulfuric acid, which can cause damage to the environment and to buildings, roads and other structures.

The acid also attacks soil minerals, releasing metals like aluminium and iron. Rainfall can then wash the acid and metals from the disturbed soil into the surrounding environment.



The impacts

Environmental Impacts

The acid and released metals can have many harmful effects. These include:

Damaging waterways and killing aquatic life – Rainfall can wash acid and toxic metals into waterways, killing organisms that are immobile (such as oysters) or that live in sediment. It can also reduce survival and growth rates of plants and animals, and promote outbreaks of disease (especially red-spot disease in fish).

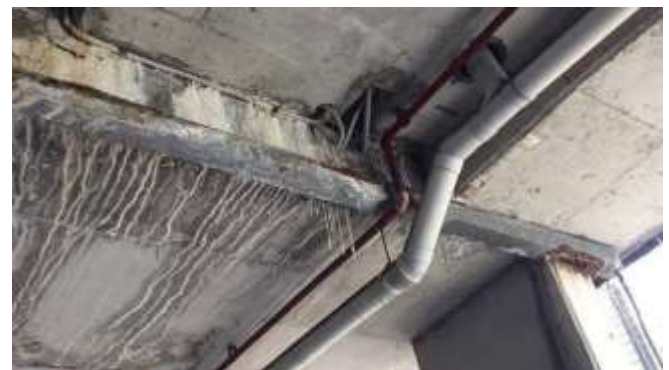
Killing plants – Very acidic soil can kill all plants growing in it.

Toxic water and dust – Acid sulfate soil and water can irritate your skin and eyes. Drinking acidic water may make animals ill.

Building Impacts

The acid and released metals can have many damaging effects.

Corrosion – Sulfuric acid can corrode concrete, iron, steel and some aluminium alloys



Where can it be found locally?

The NSW government has produced [maps](#) to show where acid sulfate soils are likely to be found. If you plan any sort of excavation in areas along the waterways, you must consider the possibility of encountering acid sulfate soils.

What can be done to prevent its damaging effects?

Minimising disturbance can be quite easy, and may involve:

- Designing the work to limit the amount of excavation.
- Relocating the work to part of a property where acid sulfate soils are buried deepest, so the amount of acid sulfate soil removed is reduced.
- Using construction methods and site management procedures that don't leave acid sulfate soils exposed to air without treatment.



Treatment

If acid sulfate soil is disturbed, it must be treated.

The most common method of treatment is to mix an alkaline material into the soil, where it can react with acidity to neutralise. Agricultural lime (powdered calcium carbonate— CaCO_3) is the most common neutralising material in use.

While minimising and avoiding disturbance can be easy, managing it is complex and should be done by appropriately trained people.

Expert advice

Any project planned in the waterfront areas must consider engaging the services of an environmental consultant prior to commencing.

For further information

Further information regarding acid sulfate soils in the Georges River Area, please contact Council and speak to an Environmental Health Officer on:

Phone: 9330 6400

E-mail: mail@georgesriver.nsw.gov.au

An interesting link for more information is the NSW EPA:

<https://www.environment.nsw.gov.au/topics/land-and-soil/soil-degradation/acid-sulfate-soils>