

Acid Sulphate Soils of Couran Cove Island Resort

What are Acid Sulphate Soils?

Acid Sulphate soils are soils that contain naturally occurring pyrites (iron sulfide). When the soil containing pyrites is exposed to oxygen, sulfuric acid is generated. Once sulfuric acid is formed, it can then leach into water tables, waterways and wetlands leading to pollution and disease of many aquatic organisms (eg. red spot disease in fish which ultimately leads to death).

Indicators of actual acid sulphate conditions may include one or all of the following:

- The presence of unusually clear or milky green water coming from within the site.
- Extensive iron stains on any drain surfaces.
- Corrosion of concrete and/or steel structures.

Significance of Acid Sulphate Soils

The presence of acid sulphate soils (or the presence of potential acid sulphate soils) can induce major constraints on many types of land use. In the past acid sulphate soils have had significant effects and constraints on activities such as:

- Agriculture (ie. crop choice and drainage systems).
- Land use planning at both the regional and local level.
- Engineering works, which include drainage and embankment systems.
- Biodiversity and ecological integrity (ie. loss and degradation of habitat, soil and water pollution, killing and disease of fish and other aquatic animals)

How can the effects of Acid Sulphate Soils be minimised or avoided?

In order to minimise or avoid environmental degradation arising from acid sulphate soils, preliminary research needs to be undertaken to assess the existence and extent of acid sulphate soil. Additionally, cost-effective management strategies need to be designed prior to development, which then need to be implemented at the appropriate stage.

In some circumstances, the most cost-effective strategy may be to avoid disturbing the acid sulphate soils altogether. Other management strategies may include:

- Treat or manage the acid sulphate soil – this may be done by burial, neutralisation, or separation and treatment
- Prevention - controlling or minimising the escape of acid sulphate leachate to the surrounding environment
- Allow for the neutralisation of acid leachate from the acid sulphate soil.

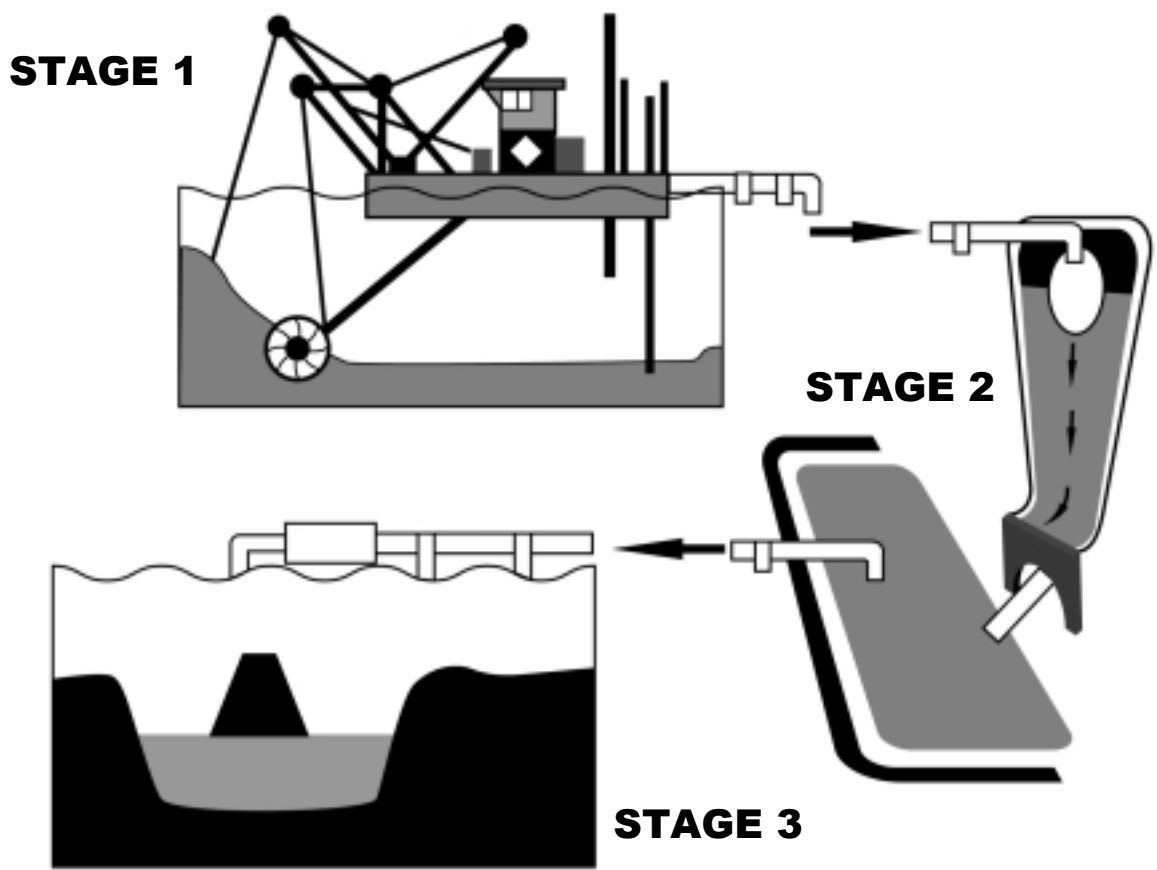
What has Couran Cove Resort done to avoid the problems associated with Acid Sulphate Soils?

A major treatment scheme costing millions of dollars was undertaken to ensure this natural phenomenon did not become a problem due to the resort's development.

Neumann Contractors has pioneered the treatment method for acid sulphate soils at Couran Cove Island Resort. The affected soil was dredged, washed and reburied under water, with an extra 500 millimetres of clean sand placed on top to ensure the affected soils would never be disturbed.

This treatment method has been effective in stopping any waterways and wetlands becoming polluted by the acid sulphate soils and has left the resort with clean sand covering the harbour, lagoon and weir wall.

ACID SULPHATE TREATMENT AT COURAN COVE RESORT



STAGE 1

- Dredging operation removing all solid material from the Harbour.
- Sand and silts containing the pyrites which generate acid once exposed to the air.

STAGE 2

- Sand and silt slurry is pumped to the reclamation site
- During dredging and filling, the silts are separated from the sand grains
- 'Dirty' water is drained off to the temporary storage ponds for later disposal.
- Reclamation is set up so there are no ponding areas and the silts are washed away freely.

STAGE 3

- Disposal pit is excavated out beneath harbour wall.
- Pit then used for final disposition of silts
- Silts are pumped into pit using tailwater pump (shown in Stage 2) and discharged below the water surface with no visible turbulence.
- Silts permanently stored in pit beneath a sand capping and an anaerobic environment.