

Central Queensland's Acid Sulfate Soils mapping project

Queensland's annual population growth is currently larger and faster than any other state or territory.

More than 203,000 people now live in Central Queensland, a figure increasing by several thousand per year. The region's economy is thriving with strong growth in the building industry, especially in coastal areas. Local government building approvals, notably for housing, have doubled in less than a decade. This growth has the potential to cause a significant environmental problem, because Central Queensland has many thousands of hectares of coastal land that contain acid sulfate soils (ASS). Therefore, this growth must happen in a sustainable way, to limit future environmental and financial problems.

Acid sulfate soils that remain waterlogged and undisturbed are relatively benign; however if disturbed, they have the potential to damage the natural and built environments.

Thousands of years ago, low-lying coastal land was inundated with sea water in conditions ideal for acid sulfate soil formation. The formation of acid sulfate soils generally requires a sulfur source (sea water), an iron source (sediments from the land), a source of organic matter, and calm waterlogged conditions to form. The resulting acid sulfate soils contain iron sulfides, usually in the form of pyrite.



Low lying land under waterlogged conditions.



Exposed layers show acid sulfate soils.



Any deep excavation may disturb and expose the dark grey and wet acid sulfate soils

When disturbed, whether drained or excavated, and exposed to air, iron sulfides react with oxygen to release sulfuric acid – the same product found in car batteries.

This reaction also releases iron, while the acidic conditions promote the release of aluminium, manganese and other heavy metals from the soil.

In high concentrations, these metals pollute the natural environment: stunting crops on agricultural land and poisoning fish and other aquatic life in waterways. The sulfuric acid corrodes concrete, iron, and steel infrastructures for waterside housing estates, swimming pools, roads, culverts, pipes, and bridges.

In coastal areas, increasing development for housing, tourism and agriculture, has already disturbed large amounts of acid sulfate soils. This has resulted in major environmental, economic and engineering problems.

This situation can easily be prevented by not disturbing acid sulfate soils (ASS).

This choice is the cheapest, most environmentally responsible, and best for the community. If accidentally excavated, acid sulfate soils must be covered immediately to stop exposure to air. To put it bluntly, "Keep your ASS covered".

Areas of acid sulfate soils that are likely to cause problems for future development need to be identified and avoided if possible. The alternative is a time-consuming, expensive process of managing and treating the disturbed area with neutralizing agents such as agricultural lime to neutralize any acidity produced.

Queensland's State Planning Policy 2/02: Planning and Managing Development Involving Acid Sulfate Soils provides general advice and guidance on the investigation, treatment and management of acid sulfate soils to support a development application. It aims to ensure that development involving acid sulfate soils in low-lying coastal areas is planned and managed to avoid the release of potentially harmful contaminants into the natural and built environment (including infrastructure).



The sulfuric acid in Acid Sulfate Soils degrades construction materials such as concrete and steel, weakening the structure.



A drill used to install a piezometer in the acid sulfate soil study at The Narrows area, north of Gladstone

The Fitzroy Basin Association (FBA) recognises that acid sulfate soils are a significant threat to sustainable coastal development.

FBA's Coastal and Marine program has supported the Department of Natural Resources and Water (NRW) to map acid sulfate soils in priority coastal areas including Yeppoon, The Narrows, near Gladstone and the Bajool / Port Alma areas. Maps of Corio Bay will be available in 2008.

These maps and the full reports along with other previous work at St Lawrence, Tannum Sands and Keppel Sands can be purchased from the Department of Natural Resources and Water (NRW) regional office in Rockhampton or accessed via www.nrw.qld.gov.au/science/slr/index.html (For assistance, email NRSDataCoordinator@nrm.qld.gov.au)



Acid Sulfate soil mapping was carried out on a section of the Fitzroy River lower estuary from Bajool to Port Alma.



The Narrows, one of the areas mapped by NRMW.

Local government agencies can use these maps to plan for sustainable development.

Coastal shires are already proactive, collaborating with the Environmental Protection Authority and NRW to identify affected areas. Each development proposal is checked against current maps and overlays in the planning scheme to determine if the area is likely to contain acid sulfate soils. If it does, it triggers a referral as well as an information request from the applicant before any development can go ahead.

Land developers can now use these new maps to identify the location and severity of acid sulfate soils in projected areas of development.

Landowners and land developers can also contact the Queensland Acid Sulfate Soils Investigation Team (QASSIT) to obtain further information and technical advice regarding acid sulfate soils. (www.nrw.qld.gov.au/land/ass/index.html or ph: 07 3896 9819)



Fish living in acid waters suffer and die from red spot disease. Massive fish kills may result.



Acid sulfate soils can cause crop stunting and failure



Natural vegetation has died and acid sulfate scalds have formed on the landscape.

Photos supplied by Fitzroy Basin Association, Department of Natural Resources and Water, Department of Primary Industries, New South Wales.

Further information

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