Sinkholes

A sinkhole is a cavity in the ground, caused by water dissolving the rock away over time

Sinkholes may be shallow or deep, and may form either gradually or suddenly. They are particularly common in limestone or dolomite formations. Sometimes a sinkhole may exhibit a visible opening into a cave below the ground. They are often circular, ranging up to tens of metres in diameter. Sinkholes are most common in the Top End, particularly in the Katherine region.

What causes sinkhole collapse?

Sinkhole collapses are most commonly caused by changes in the surface or subsurface flow of water. They often form after a major storm or flood. Human activity can also induce sinkhole development and collapse. Channelised draining or any changes made to local surface drainage, excessive groundwater pumping and leaking water lines can all cause sinkholes.

Sinkholes can develop suddenly when, for example, a soil plug in an existing solution cavity is washed away or when there is a catastrophic collapse of the roof of a cave.

What problems do sinkholes cause?

The most obvious danger of sinkholes is that a deep hole is a potential hazard for people and animals. They can also undermine and destroy infrastructure such as buildings or roads. In Katherine, roads, fences and agricultural land have been affected, but to date no houses have been seriously damaged by sinkholes.

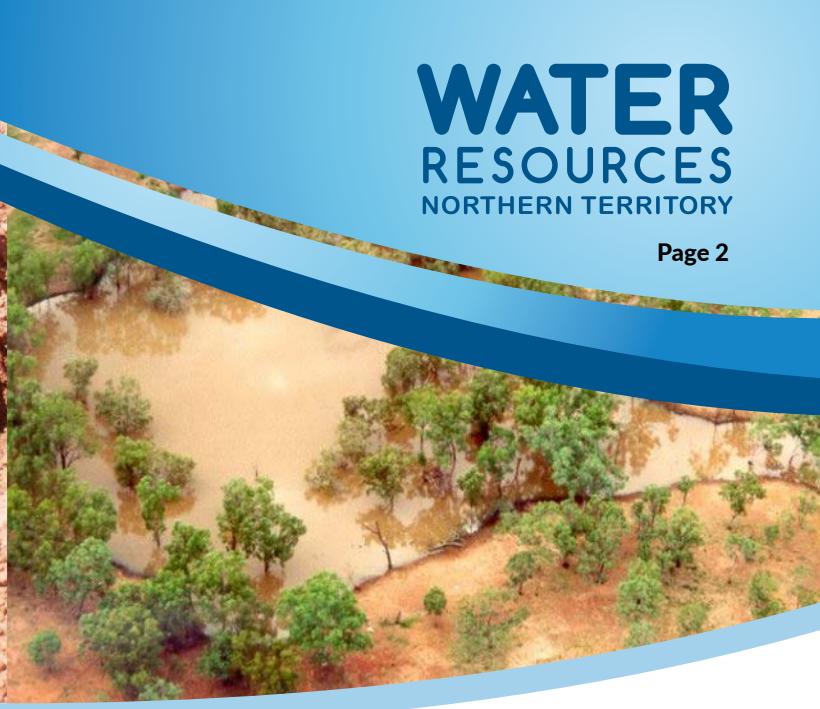
Sinkholes can also provide a pathway for surface waters to drain rapidly down to the watertable and this creates the potential for any pollutants to contaminate groundwater.

How can potential sinkholes be found?

Certain landscape features can be used to identify areas that may be subject to sinkhole development. Around the township of Katherine for example, limestone outcrops indicate sinkhole prone land. On-ground surveys are useful in identifying existing or emerging sinkholes. Ground penetrating radar surveys can be very effective for locating sinkholes and caves in limestone formations, but are very costly.

Living with Sinkholes

Known sinkholes should be buffered from any areas of infrastructure development or clearing, to reduce the likelihood of sinkhole collapse and/or groundwater contamination/sedimentation. Where possible, surface runoff should not be diverted into a sinkhole and water in areas prone to sinkholes should not be diverted to areas where it can pool.



What happens if a sinkhole develops on my block?

Firstly, it is important to assess any changes to the drainage regime which may be causing the sinkhole to develop, and address these. If the sinkhole is of no threat to people, livestock, property or infrastructure, then no immediate action needs to be taken besides fencing or ongoing monitoring of its development.

If the sinkhole does pose a threat, then take appropriate action. Find an expert, such as a geotechnical engineer, who can advise on appropriate methods of remediation.

Interesting Facts

Where else in Australia has sinkholes?

- Mount Gambier Buchan, Victoria
- Northern suburbs of Perth Newcastle
- The Nullarbor Plain and Western NSW
- Mole Creek, Tasmania

Australia's largest sinkhole is found in Mount Gambier, SA.

Potential Indicators

- Slumping or sagging soil or infrastructure
- Structural cracks
- Development of erosion rills or gullies

Preventative Measures

- Ensure that houses and roads are not constructed on or near caves;
- Never direct water towards sinkholes;
- never dump rubbish in sinkholes;
- reduce soil erosion; and
- promote plant cover - bare ground leads to poor soil structure enabling cavities to be exposed.

Useful Resources

Department of Land Resource Management Technical Report No 11/2002, *Land degredation associated with sinkhole development in the Katherine Region.*

Department of Land Resource Management Maps:

- Sinkholes of the Katherine Region
- Land units and sinkholes of Katherine Region

Greening Australia NT:

- Karst Limestone is Unique: A landowners guide to management DVD.

NORTHERN TERRITORY GOVERNMENT

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