AUSTECH
SURVEYING AND MAPPING PTY LTD

Australian Institute of Mine Surveyors Conference
Mackay - 2015

‘Underground Sinkhole Survey Project at Mangoola Coal Mine’

Peter Rogers

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"Your Complete Survey Solution Provider"

Austech Surveying and Mapping provides cutting edge and practical Geospatial Data Acquisition, Mapping and Survey Solutions.

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Our Businesses:

- *Undergound Cavity and Void Management surveys*
- Stockpile Volume Surveys
- 3D Lidar Mobile Mapping surveys/ Lidar
- Sale of Cavity and Void Management 3D scanners
- Technical Support & Training
- Hire and Rental
- Data Processing

Void/Cavity Management includes:

- *Cavity and void assessment and management*
- Stability monitoring
- Ore pass monitoring
- Stope Surveys
- Limited & hazardous access surveys
- Subsidence investigations
- Collapsed mine workings
- Volumes of voids

Why is Void Management important?

- Voids and cavities in mines (both working and abandoned) can pose a serious potential threat to worker and public safety due to the possibility of failure and collapse.

- Proactive solutions need to be developed in order to minimise subsidence risk where mine workings are present.

- The structural integrity, the geometry of the voids, their depth and condition, and the nature of the overlying strata must be determined.

Why void management?

Why void management?

Our investigation services can help Mine managers assess the stability of mine works and judge whether or not a cavity needs to be filled, whether work can proceed, and what operational plans should be put in place to maximise productivity and safety.

C-ALS® borehole deployable laser scanner for concealed cavity and void scanning

Borehole camera

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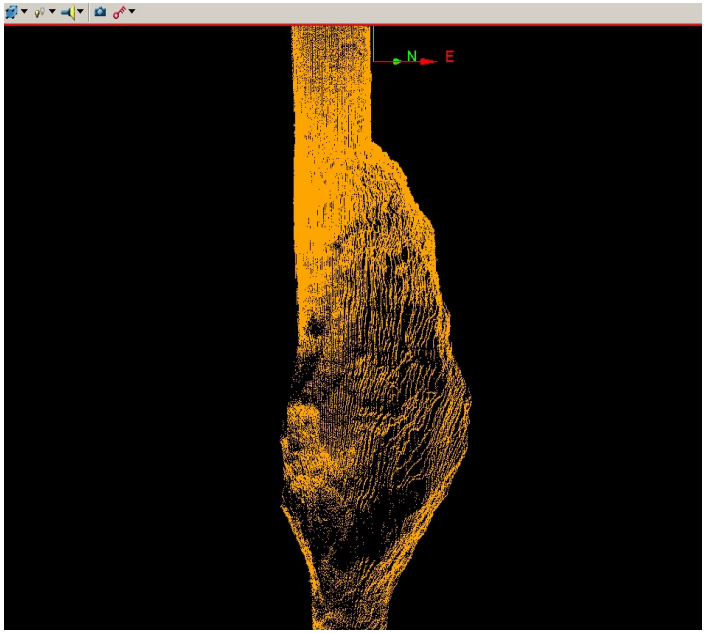
Various Survey Methods

Sample data- model of the void



We can process the data into a 3D model in various formats

That Point Cloud data can be exported to clients' modelling software on site.

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Case Study: Sinkhole Survey Project at Mangoola Coal Mine

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Possible sinkhole or cavity close to the workings of an Open cut coal mine

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What's the best way?

The immediate questions: where?, how far?, which direction?, how deep?

Concerns for impact on the main open pit area.

Challenges - Unsafe for personnel, could not get too close.
Narrow opening on unstable surrounds.

Technologies considered - GPR, Terrestrial scanning, cameras

Solution - It seemed C-ALS scanner may be a viable option.
But needed to be operated by the Rescue personnel with harness and other safety measures

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Implementing the Solution

The C-ALS scanner is a 50 mm diameter scanning rod which could be fed down the opening.

Thus we were able to instruct the trained rescue people to do the deployment whilst we remained outside the danger zone.

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Deployment description

Austech were able to monitor the progress of the deployment and give instructions accordingly with real time display of the resulting scans.

Process took a couple hours in the field. Back in the office we produced a geo referenced point cloud that could be incorporated into the mine plan with their own software.

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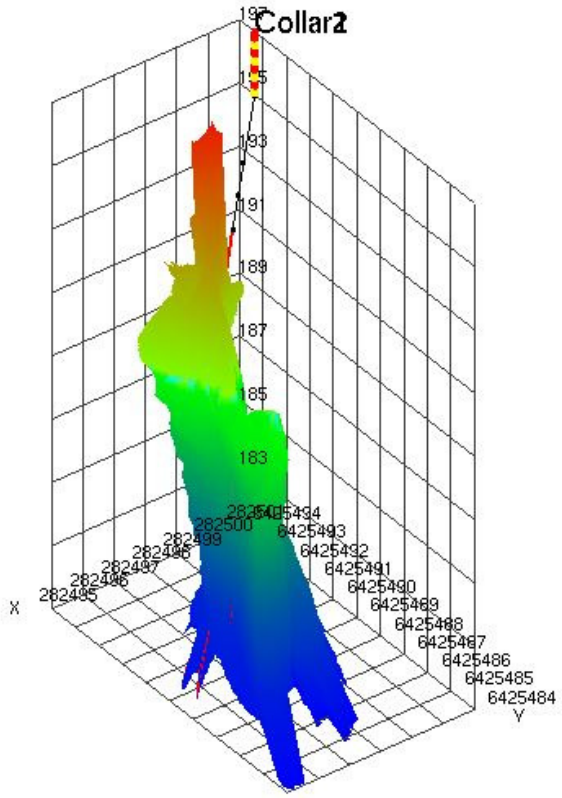

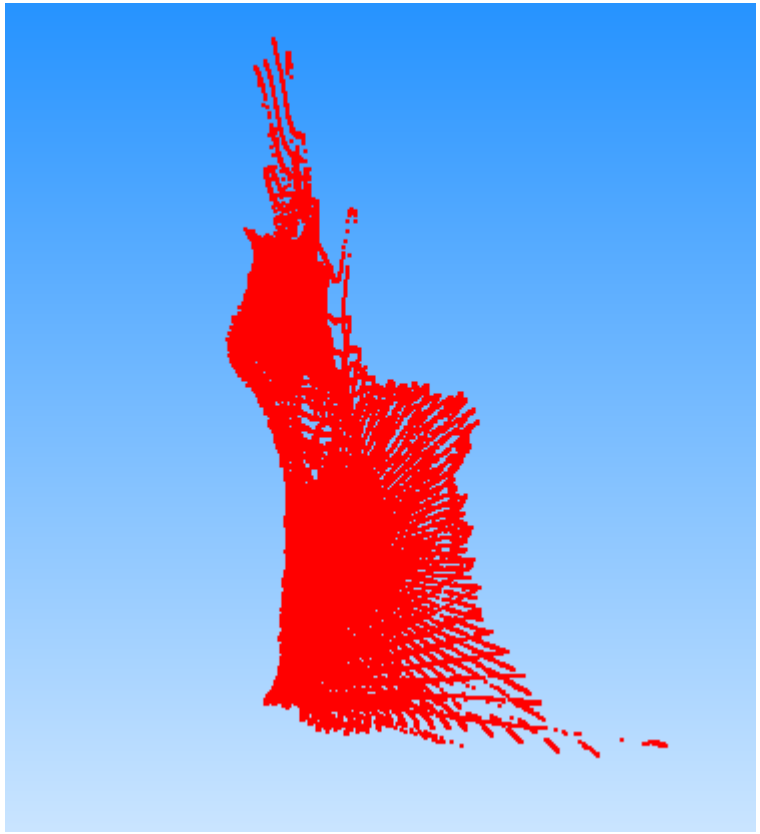

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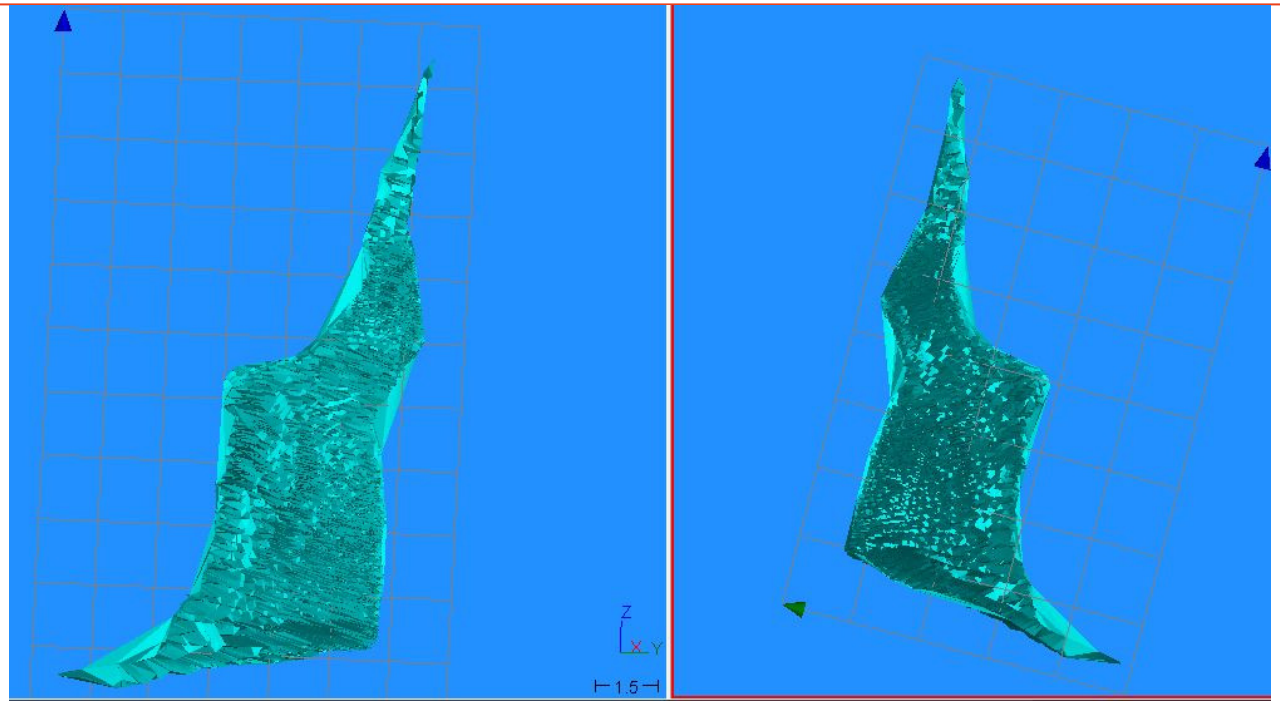

Outcome - Mangoola Coal were able to effectively assess the extent and location of the inaccessible sinkhole.

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Boretrak - Rugged Borehole Deviation Surveying System:

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Questions ??