








BURTON COAL MINE
BURTON HIGHWALL CHALLENGE

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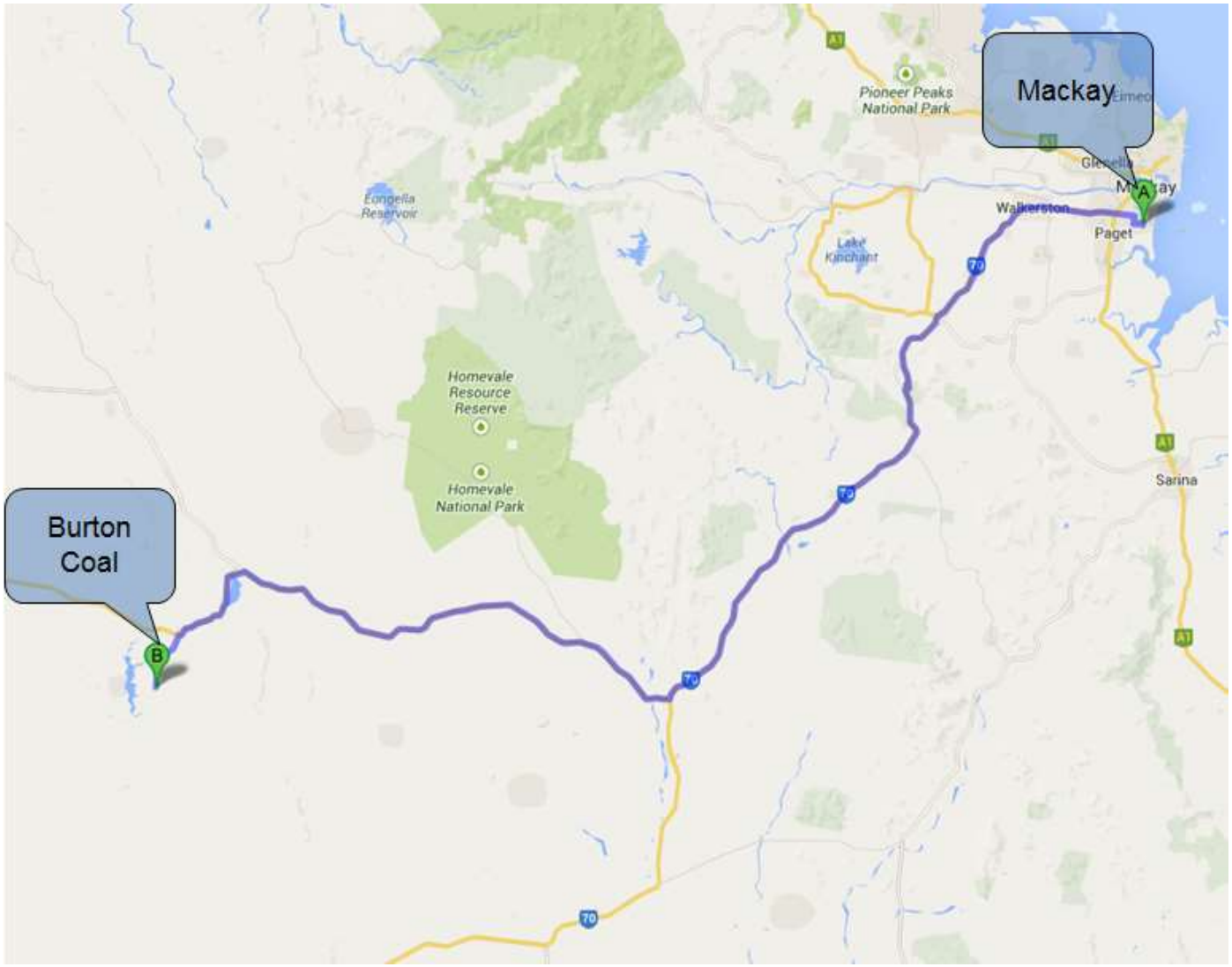
19 August 2014

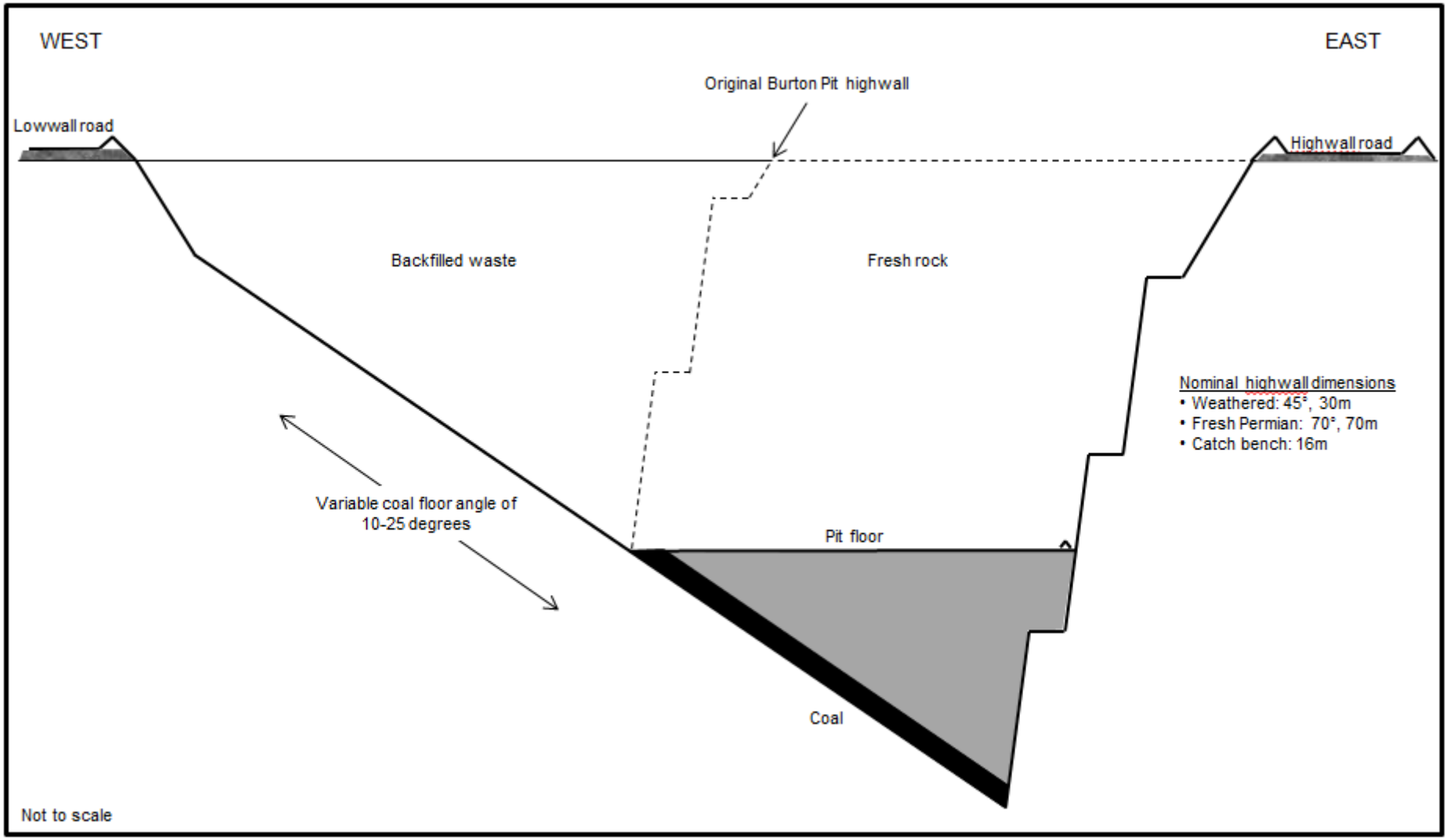
THIESS

Location

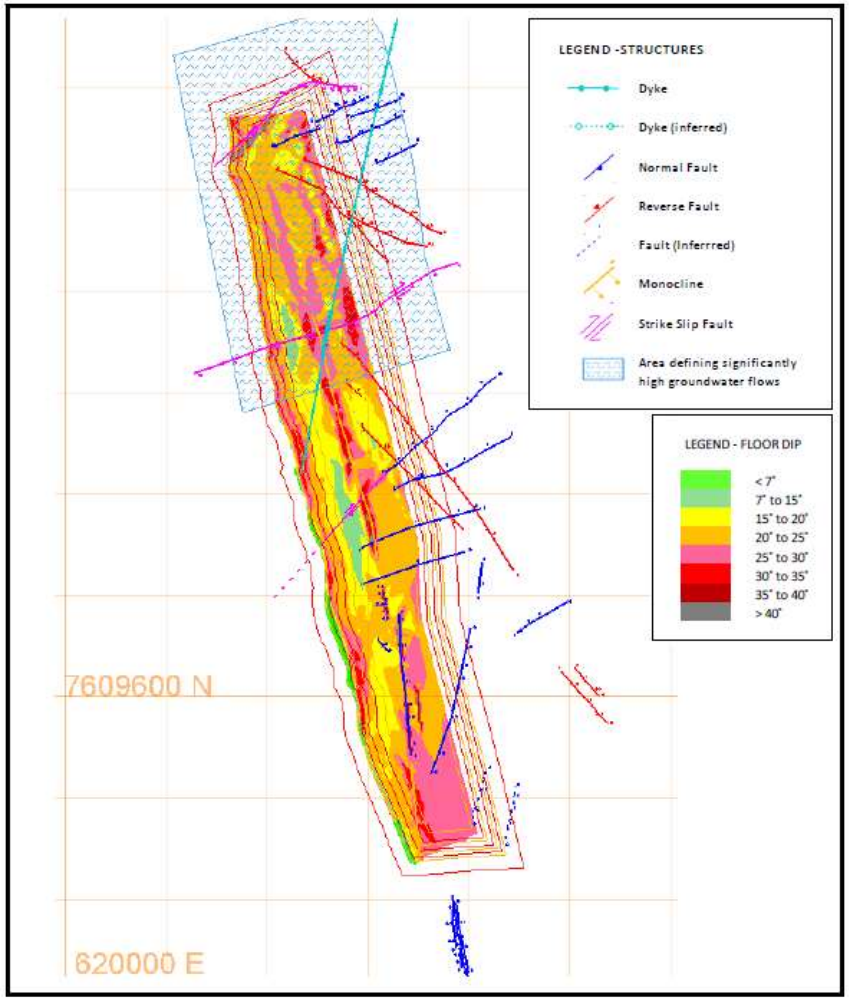

Mackay
Burton Coal
A
B
Pioneer Peaks National Park
Eungella Reservoir
Homevale Resource Reserve
Homevale National Park
Lake Kinchant
Walkerston
Paget
Sarina
A1
70

Mining Scenario - Terrace Mining

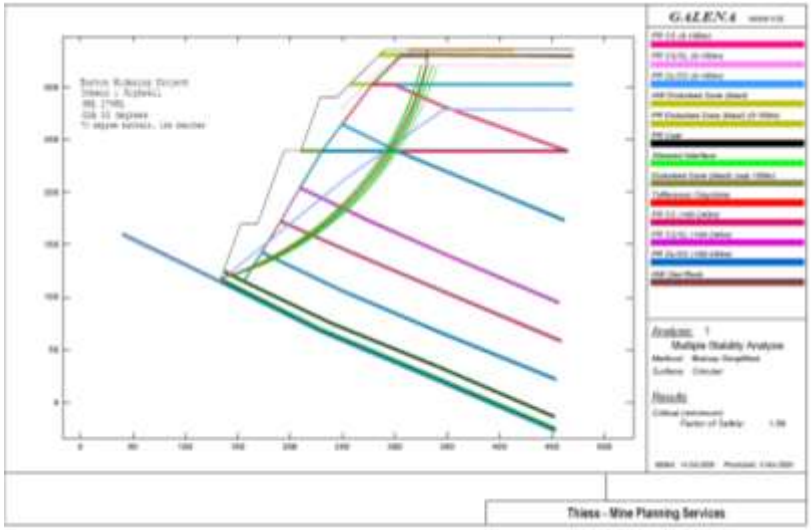
Mining Scenario

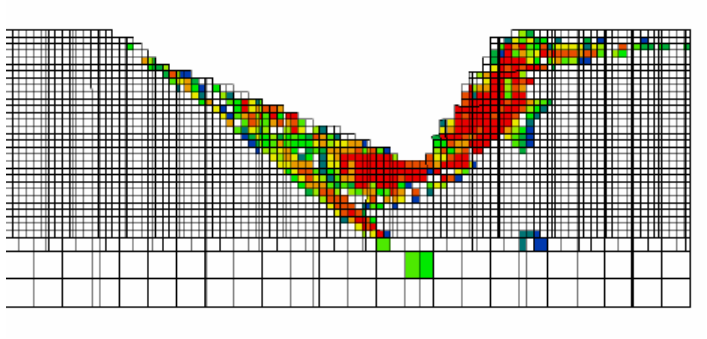


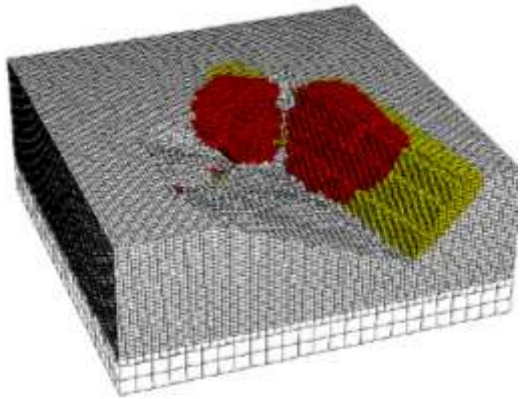
Geology

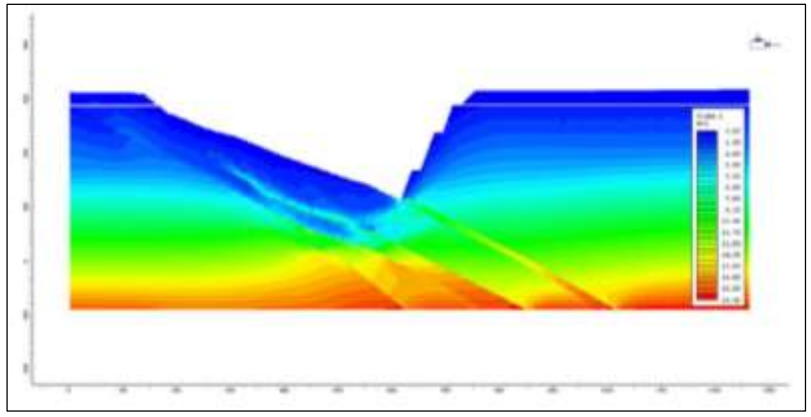

LEGEND -STRUCTURES
Dyke
Dyke (inferred)
Normal Fault
Reverse Fault
Fault (Inferrred)
Monocline
Strike Slip Fault
Area defining significantly high groundwater flows
LEGEND - FLOOR DIP
< 7°
7° to 15°
15° to 20°
20° to 25°
25° to 30°
30° to 35°
35° to 40°
> 40°
7609600 N
620000 E

Geotechnical Baseline Study



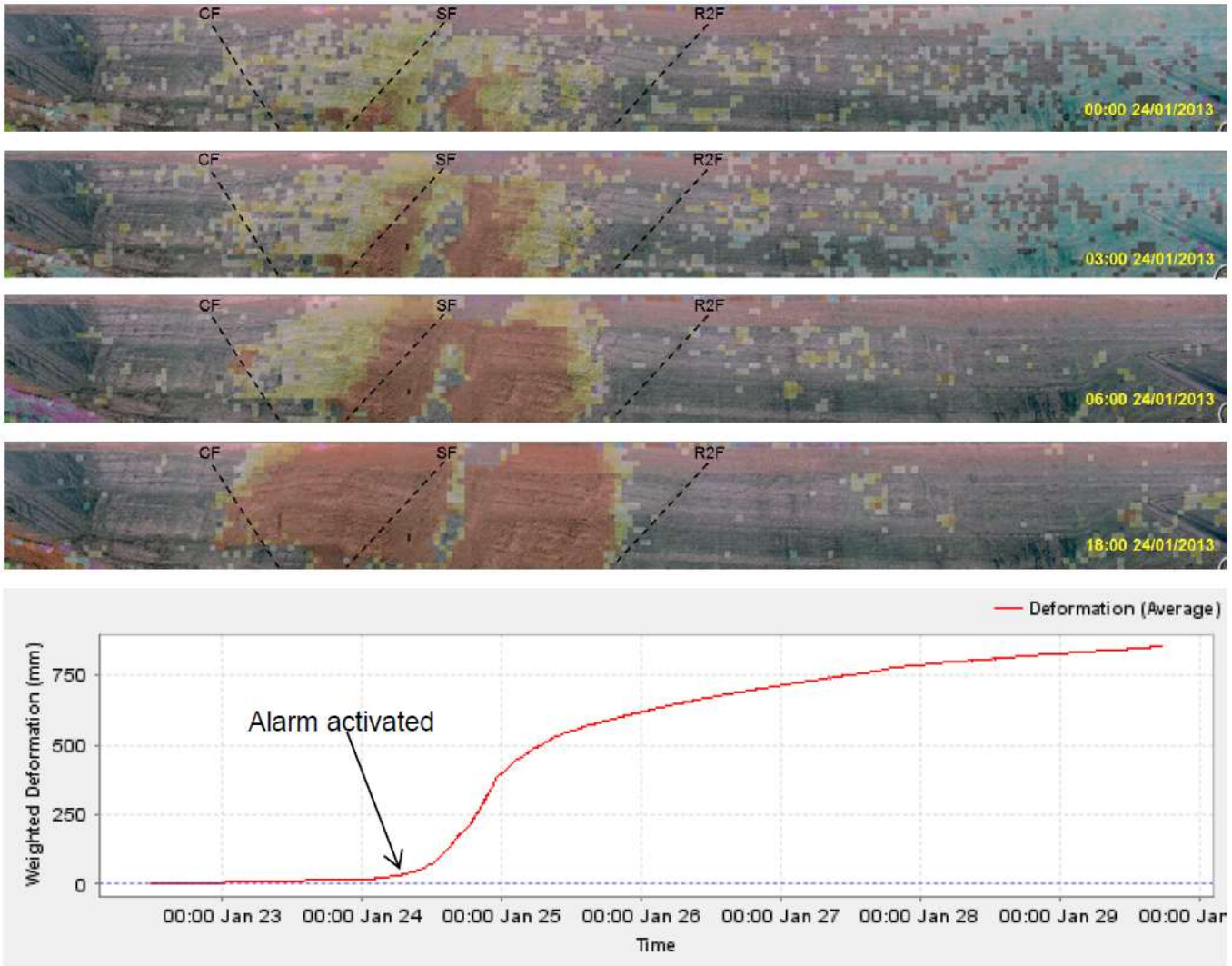


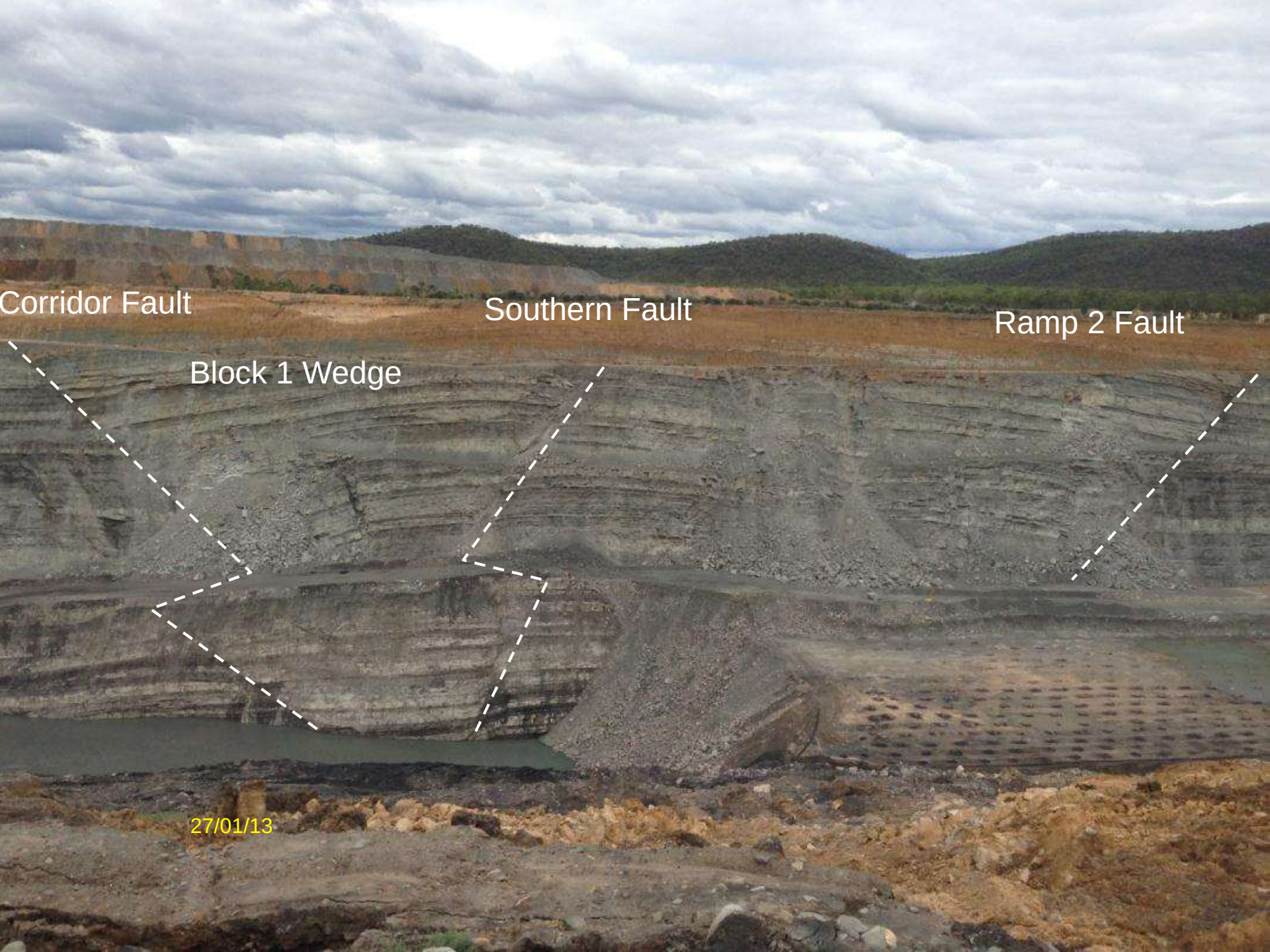





Corridor Fault
Southern Fault
Ramp 2 Fault
Block 1 Wedge

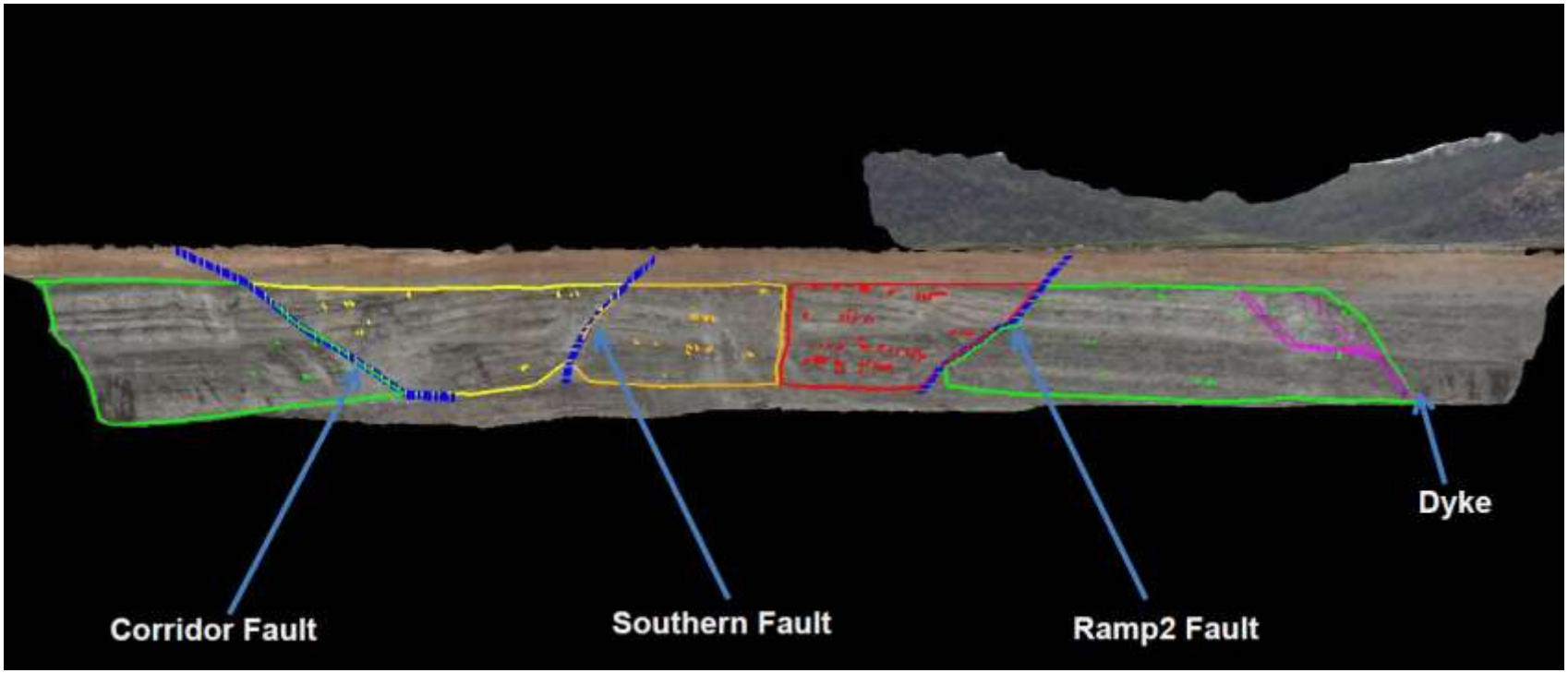
Australia Day Highwall Event




Corridor Fault
Block 1 Wedge
Southern Fault
Ramp 2 Fault
27/01/13

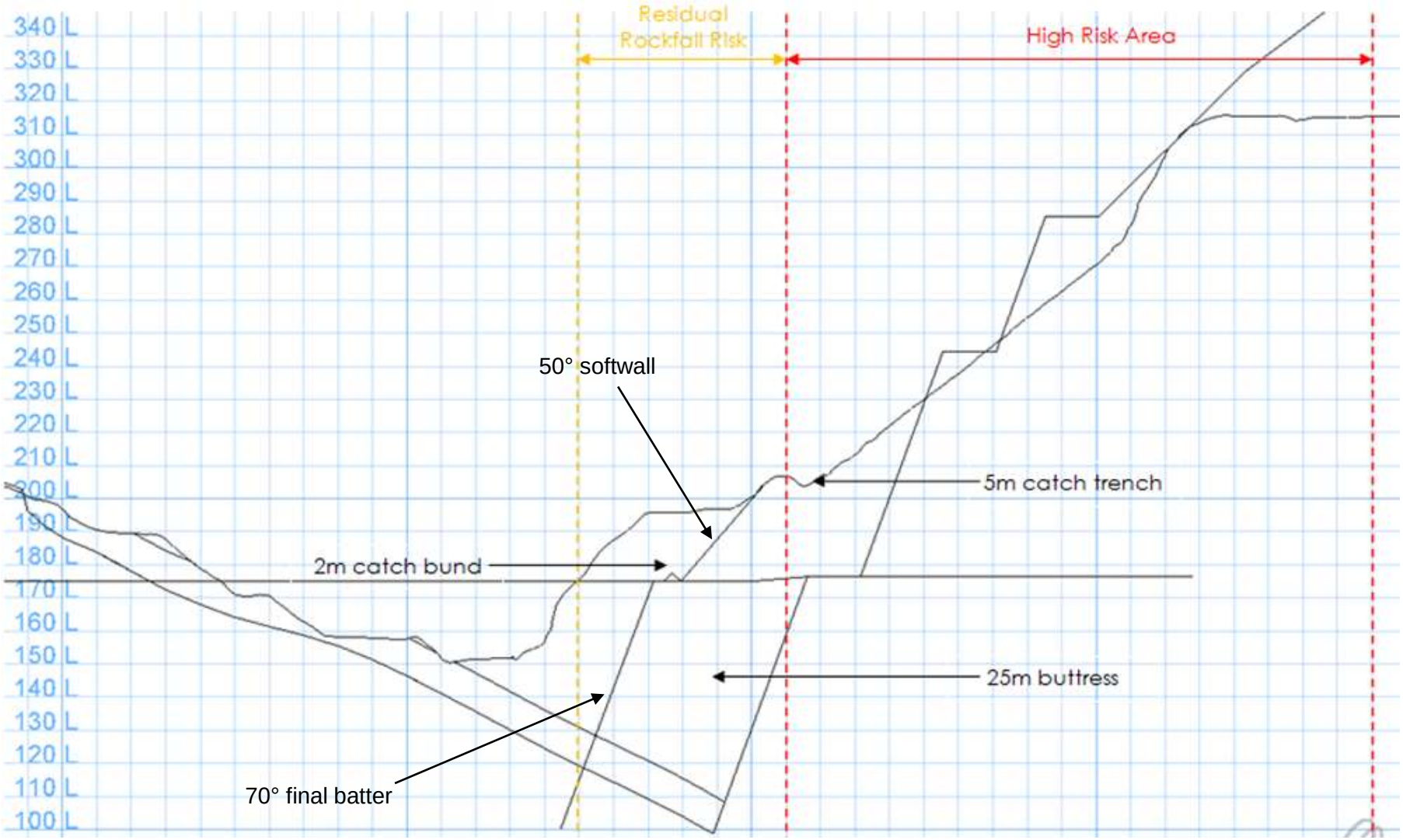

27/01/13

Geotechnical Analysis



(GeoTek Solutions, 2013)

Highwall Buttress Method



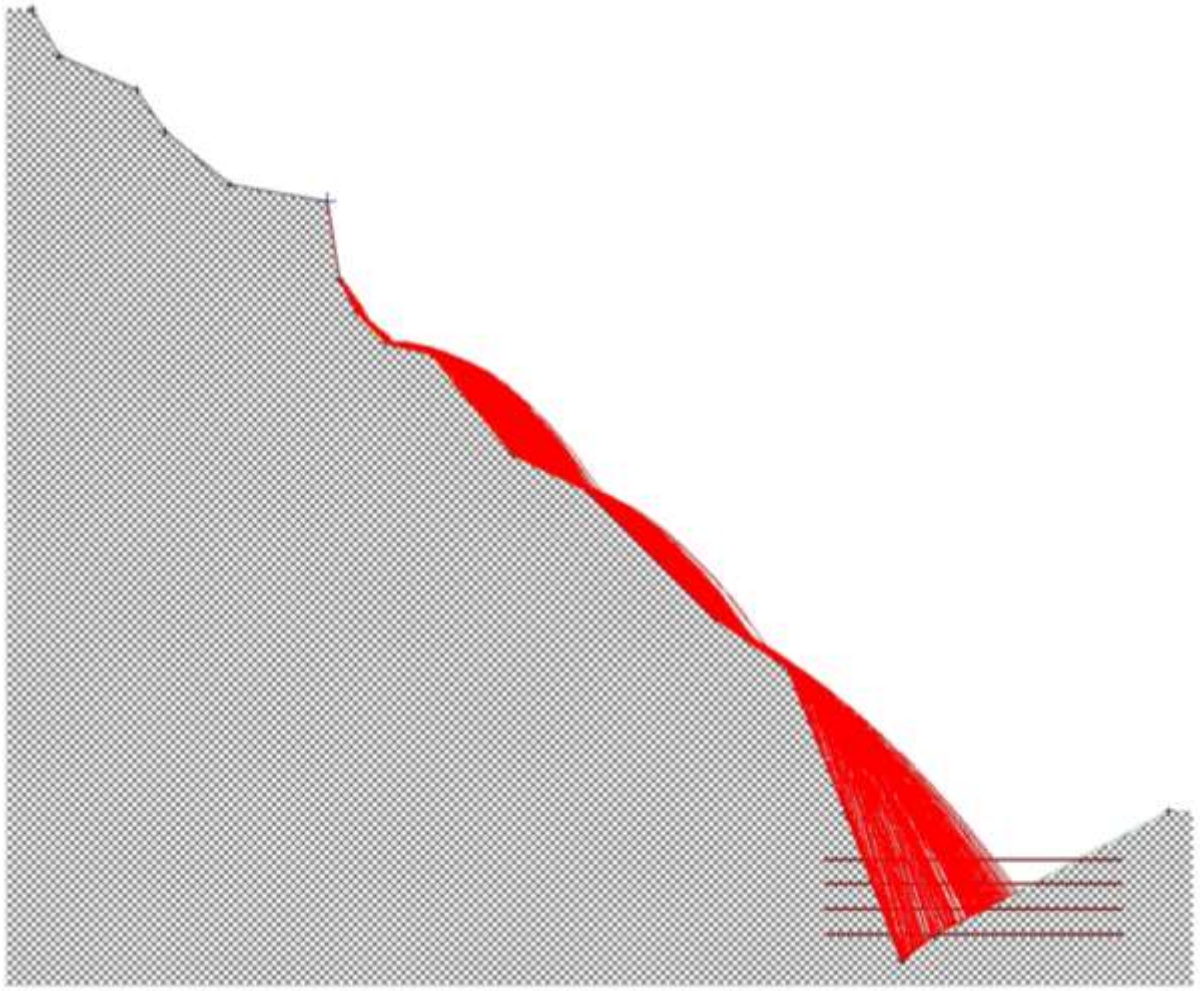

Operator
Remote Controlled Dozer preparing catch bunds in high risk area

Fall of Ground Definitions & Controls

Fall of Ground Type	Surface Area	Key Control
Major	>5 pixels (>125m^2)	Safety critical slope stability radar monitoring
Minor	>1 pixel, <5 pixels (25 to 125m^2)	Spotter
Rockfall	<1 pixel (<25m^2)	Physical barrier (catch trench or bund)

Radar file from May 2013 showing two pixels that had been activated by Minor Fall of Ground – in this case, an alarm was not required due to the ability of the physical controls to contain all of the material

Time-dependent Effects



Key Learnings

- The Burton Widening Pit is an example of safe mining in a deep, steep and long pit with significant geological challenges
- Time-dependent effects are difficult to capture in geotechnical models and must be managed as they arise
- With adequate management systems, slope stability radars can provide reliable monitoring of large scale slope instability to reduce risk to an acceptable level
- However, radar monitoring is not a cover-all tool and small scale instabilities must be managed in other ways

Acknowledgements

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Thank you