



EMPOWERED

Metropolitan Low-Level Outburst Incident Learnings and Improvements

Wednesday 19 June 2013
Wollongong Outburst Seminar
Master Builders Club

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Metropolitan Coal



Presentation Overview



- Metropolitan Coal
- The Incident
- Improvements in our Outburst Management Processes
- Learnings for Peabody Australian Platform and the Illawarra Coal Industry

Metropolitan History – 125 Years Old



- This year Metropolitan Mine turned 125 years old
- The mine has a long and proud mining history in the Illawarra
- Peabody acquired Metropolitan in 2006 when it recognised the potential of the operation and the direction of coal prices
- Peabody has invested \$450 million to date



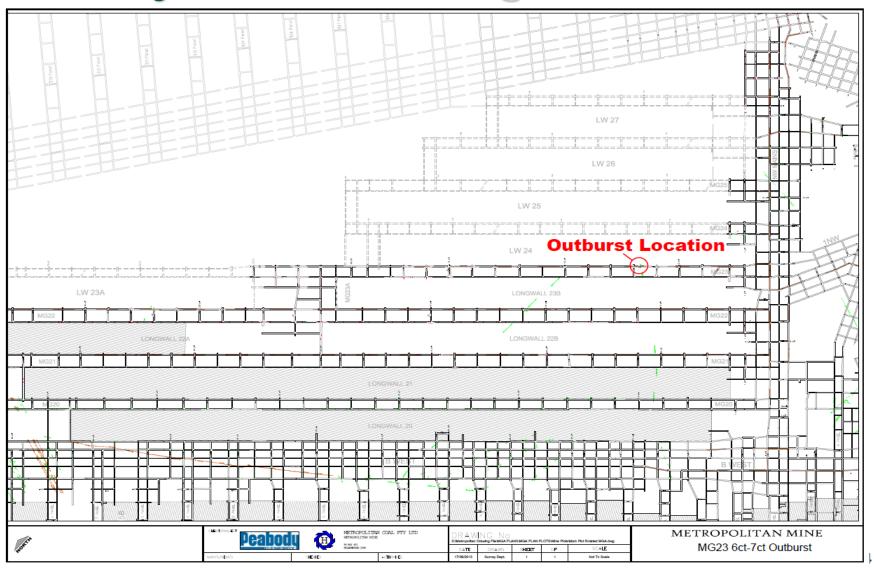




Metropolitan – Low-level Outburst Location



MG 23 B hdg 6-7 c/t - 17 October 2012 @ 11.30am



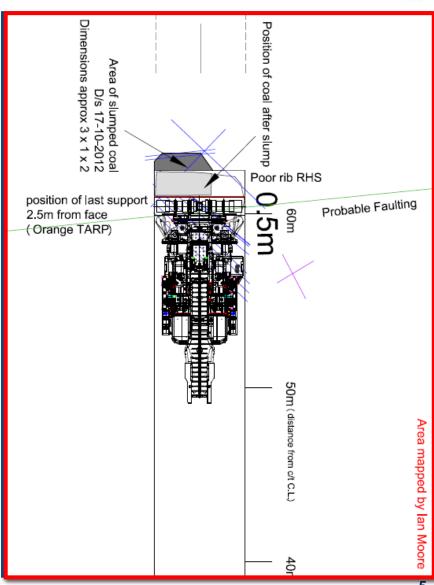
Incident Sequence of Events



EVENT

- 1. During bolting cycle the face slumped in at commencement of fault zone MG23 6-7ct. Approximately 5t of coal was displaced.
- Pocket of CO₂ Released exposing 5 operators to > 1.99% (Maximum reading on miner sensor)
- 3. Operators withdrew immediately to fresh air, minimal exposure, no harm. Withdrawal was trigged by the readout of the onboard CO₂ monitor.
- 4. Incident scene isolated by Deputy. Undermanager & M.O.M.E. notified.
- 5. Outburst review committee inspected the incident scene.
- 6. PTM revoked by M.O.M.E.
- Inspectorate notified CMHSR CI 56

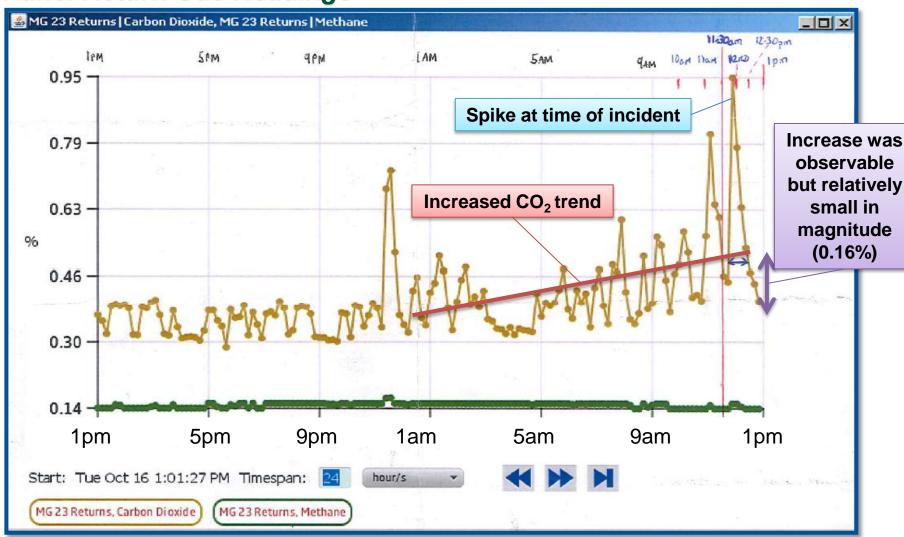
 g Gas accumulation, withdrawal of men.
- 8. Drill rig mobilized to commence coring for gas content determination at face.



Rise in Gas Levels Prior to the Incident



Panel Return Gas Readings

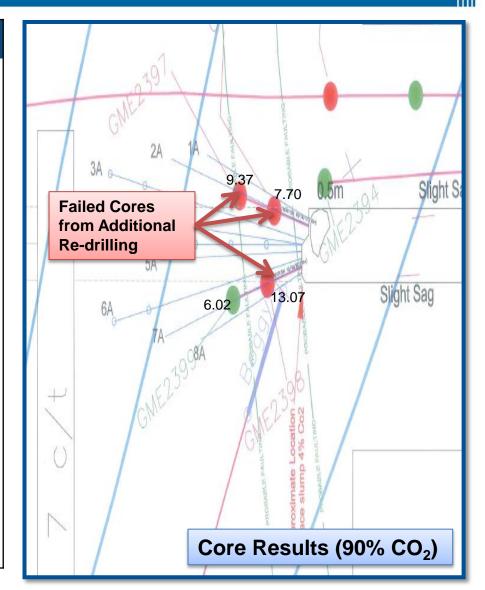


Contributing Factors



FACTORS

- 1. Cross drainage hole in the fault zone incomplete due to boggy (soft coal) conditions
- Permit to mine issued based on flank passed core result.
- 3. No gas issues when mining through fault in adjacent roadway (A Hdg)
- 4. Historical data of the mining through the fault zone not reviewed (as not previously identified as a risk at metropolitan)



Post Incident Sequence



POST INCIDENT EVENTS

Inspection of Incident scene with Inspector of Coal mines and Site Check Inspector

Area had been cleaned and supported to the face. Evidence of outburst indicators

Incident re-classified as CI 55 "low-level outburst"

Clause 51 notice served – Prohibition further mining MG23 B 6-7ct

Drill cores verified high in-situ CO₂ content

High intensity drilling regime initiated in face zone

Unsuccessful in reducing insitu gas content to threshold levels

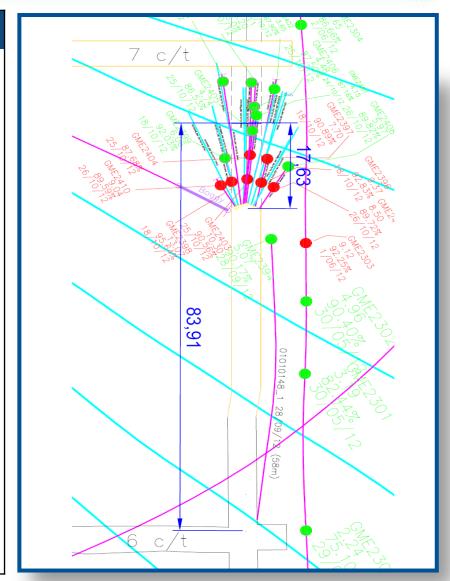
Risk assessment conducted on grunching through outburst zone

Reviewed grunching procedures and training packages

Setup panel for grunching. Spiled (pre-supported) roof level with 4m tendons

Successfully grunched through zone without incident. No outburst triggered during shot firing

Recommenced normal mining with 30MB. Unit was off-line for 6 weeks due to incident



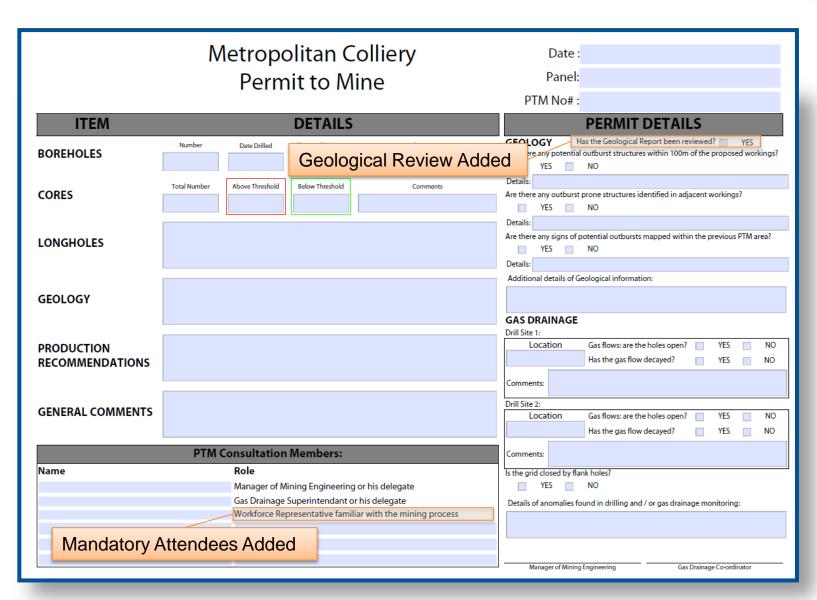
Learnings and Improvements – Changed Definition of Outburst in Metrop O.M.P.



Previous Definition	New Definition
"A <u>violent</u> ejection of gas, coal and/or stone from a mining face. Typically the volume of gas released is significantly higher than can be accounted for by the gas content of the coal displaced."	"A sudden release of gas and material from the working place that can vary in magnitude and intensity." Quoted from MDG1004

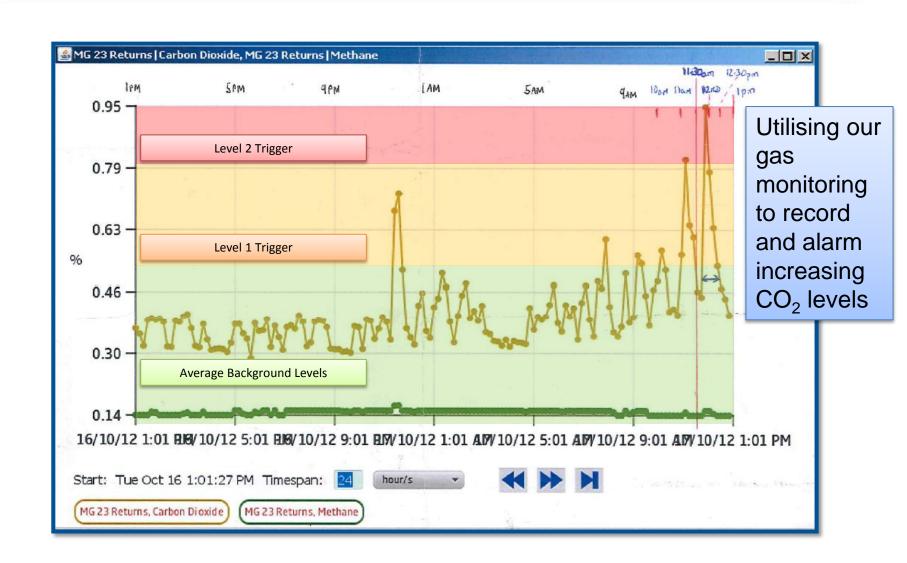
Improvements to the Metropolitan Permit to Mine





Re-Evaluation of Panel Gas Monitoring TARP's





Improvements to On-Board Gas Monitoring and Warning System



Prior to event

- CO₂ remote display partially hidden behind cover
- CO₂ warning strobe not visible to off drivers side

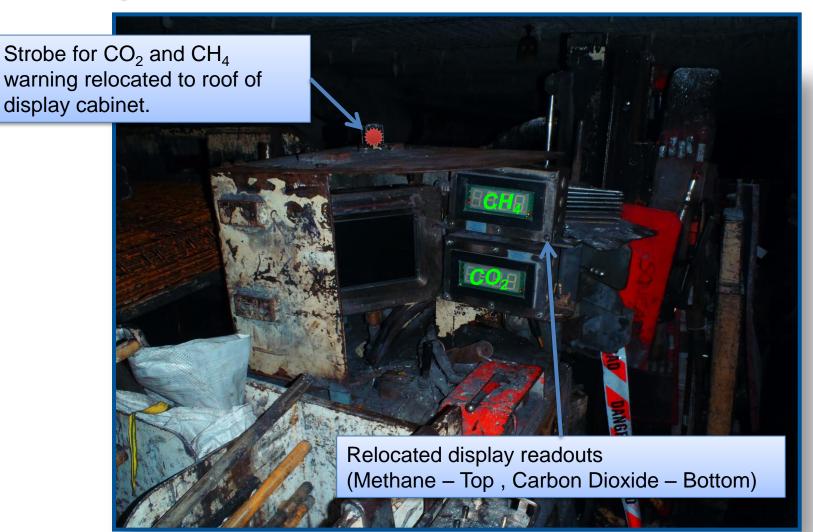
Changes made following event

- CO₂ remote display relocated to be more visible
- CO₂ warning strobe mounted on top of cover and can now be seen from both sides of the miner

Improvements to On-Board Gas Monitoring and Warning System



Visibility of Gas Levels to Face Crew



Improvements to On-Board Gas Monitoring and Warning System

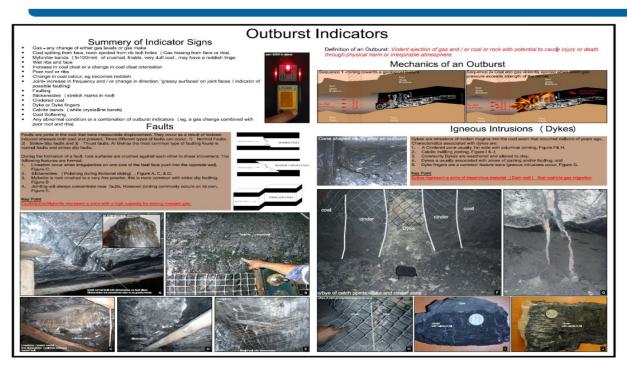


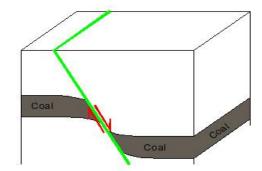
Visibility of Gas Levels to Face Crew

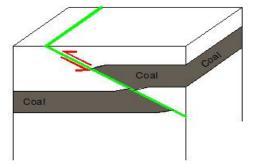


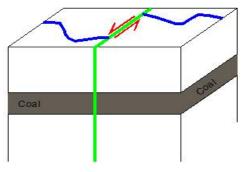
Education and Training of Workforce



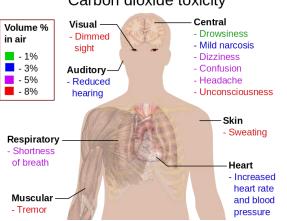








Main symptoms of Carbon dioxide toxicity





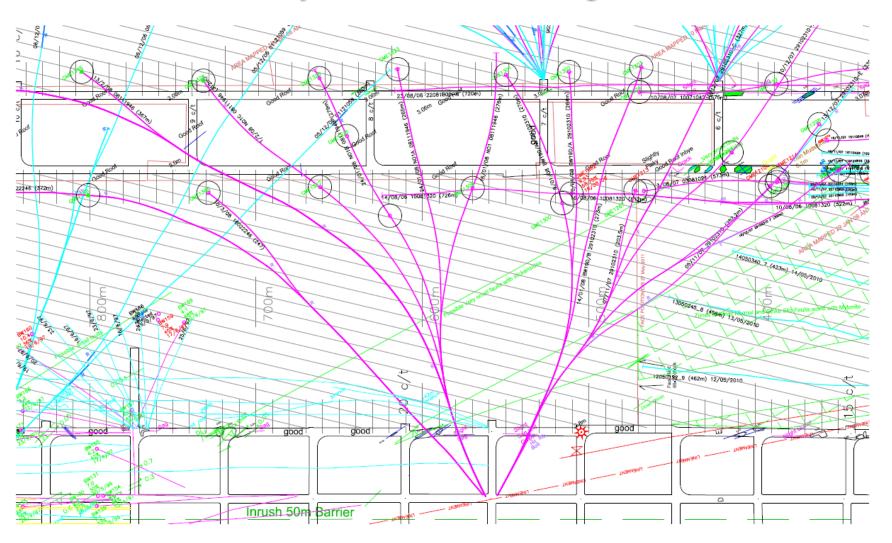
Improvements to Drilling and Coring Practices



- Fan pattern designed to suit environment
- Flank holes must close the "Grid"
- Sampling at maximum 60m spacing in worst case location for gate roads
- Sampling every 10m on both sides of roadway in outburst prone areas
- 4" drainage hoses from stand-pipes increase flow rate
- Gas flow readings on every hole once every 2 weeks to monitor reduction in gas reservoir
- Sampling between and in proximity to identified fault zones

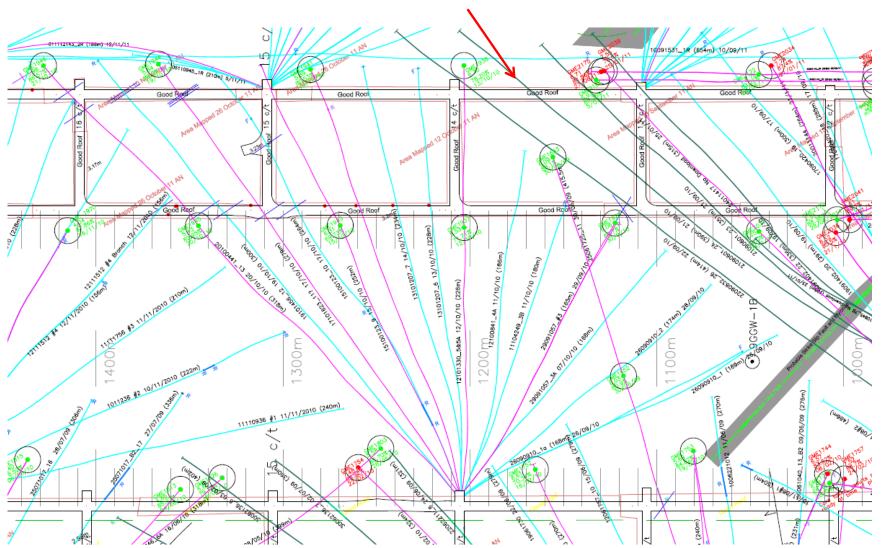


Generation 1 - January 2008 Focus on Coring



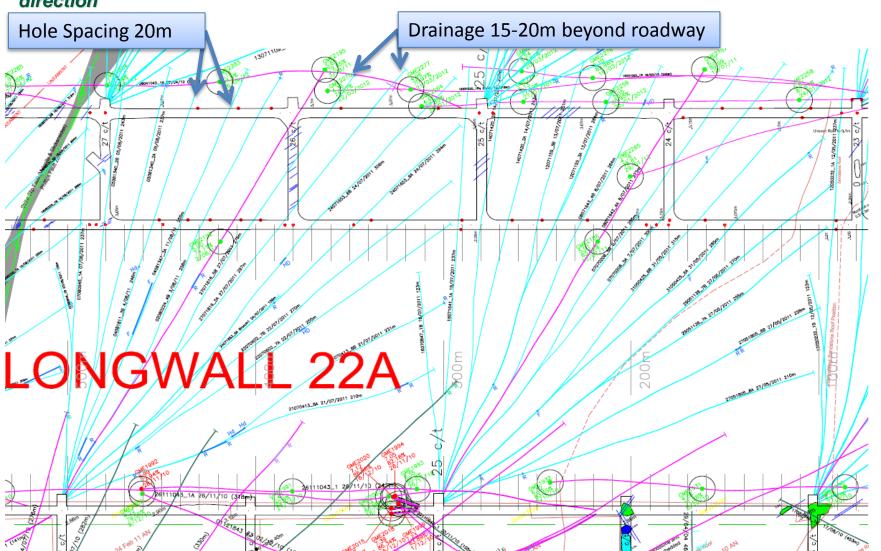


Generation 2 – October 2010, Flankholes Introduced



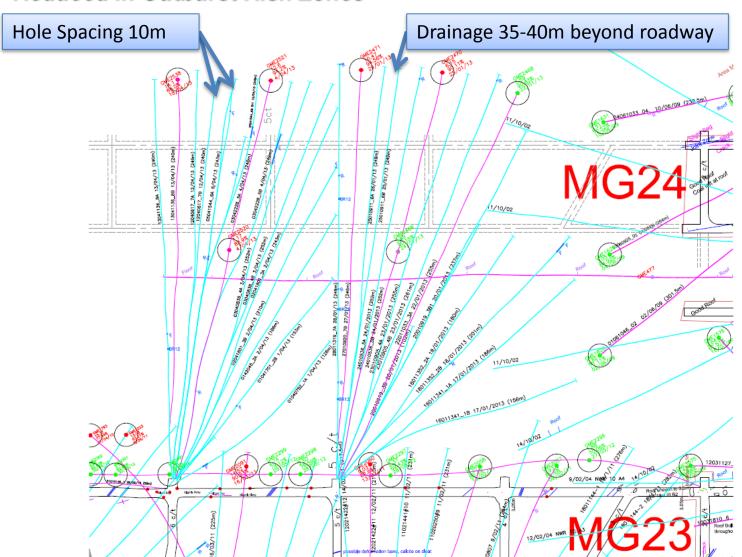


Generation 3 – November 2011, Extended Drilling Beyond Planned Roadway, optimized drilling direction





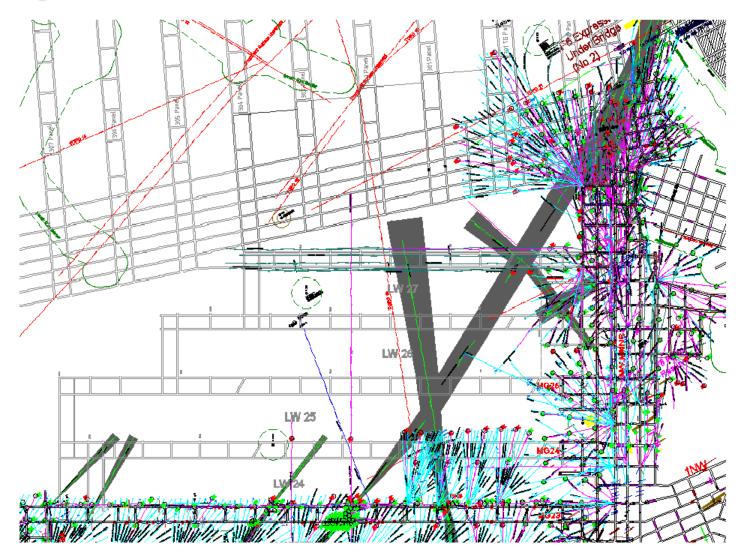
Current – Holes Further Extended Beyond Planned Roadway and Spacing is Reduced in Outburst Risk Zones



Geological Learnings Post Incident



Mapping Of Outburst Prone Areas



Key Learnings



Key Learnings for Peabody and the Coal Industry

- Classic definition of an outburst is now redefined
 - An outburst does not have to be violent in nature
- Prediction of structures
 - Outburst prone zones shaded on the mine plan to pre-determine adequate drilling and coring patterns
 - Abnormalities detected during drilling are logged
 - Cuttings are reviewed by Geologist for Geotech assessment
 - Geological information to be thoroughly reviewed at the PTM meeting. Geotech submits a report at every PTM
- Review all historical outburst incidents at Metropolitan

Key Learnings



Key Learnings for Peabody and the Coal Industry

- An educated workforce is a more confident, safer and productive workforce
- Compliance core regime around structures is critical
- Photos of incident scene poor quality
 - Training of management in underground photography completed
- The improvements to the Outburst Management Processes has lowered Metrop's Outburst Risk profile and improved drivage rates
 - Record development metres achieved in May 2013 with enhanced compliance requirements
- Learning's and knowledge of Outburst risk shared on the Peabody Platform and the Illawarra UG coal mines

Importance Of Sharing Key Learnings



Metropolitan's sister Longwall mine in Qld

- North Goonyella
 - Very Gassy
 - 420 m deep
 - Operating under Outburst Management Plan
- Recently had a similar outburst associated with structures and coring regime
- Peabody instantly directed sharing of learnings, information and Management Plans between sites and operations personnel flew interstate to ensure our knowledge base was utilised to full potential.



QUESTIONS?











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