



# METHANE EXCEEDANCE TG604

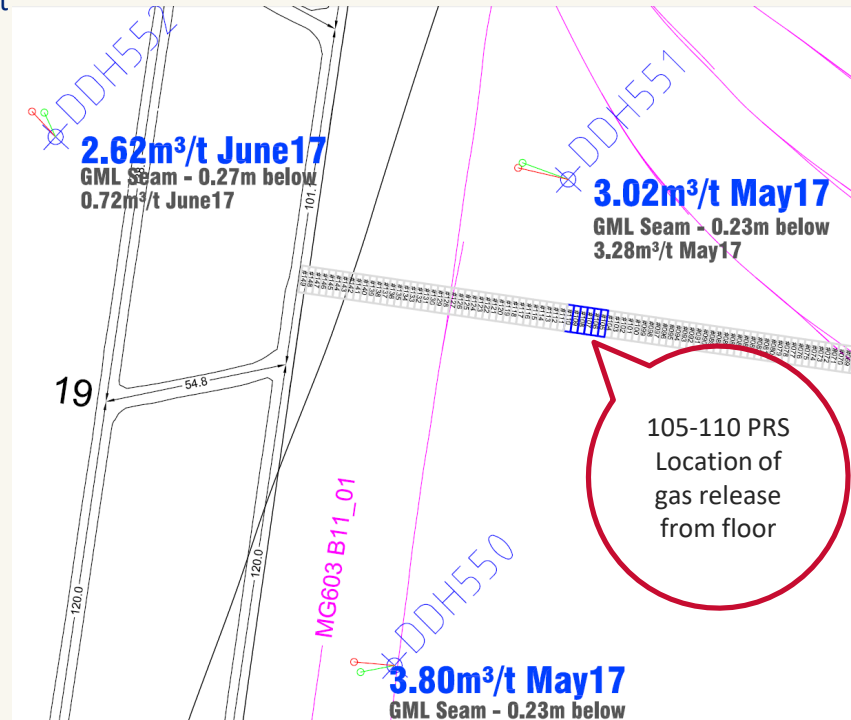
Moranbah North Mine  
June 2020



# HPI SUMMARY

## Executive Summary from LFI report

- Power to the LW604 face tripped back to the DCB at 11:50am on the 20<sup>th</sup> of July while completing the 2<sup>nd</sup> run into the TG. During the initial investigation the face ERZ Controller identified methane (CH<sub>4</sub>) blowers in the floor between #105 and #110 PRS and a GB CH<sub>4</sub> concentration of up to 2.3%. Further investigation found the TG drive CH<sub>4</sub> sensor had failed and there was >2.5% CH<sub>4</sub> in the TG roadway.
- Leading up to the time of the event CH<sub>4</sub> levels in the TG roadway was between 1.6% and 2%. At 12:12pm the TG outbye sensor passed 2.5% CH<sub>4</sub>, peaking at 12:22pm at a GB concentration of 3.36% CH<sub>4</sub> and did not drop below 2.5% until 1:25pm. SO670A was the closest goaf drainage well but was in standby mode due to low methane and high oxygen (O<sub>2</sub>).
- The Face ERZ Controller used cool tubes and brattice sales along the face to direct ventilation into the rear walkway and dilute CH<sub>4</sub> make from #105 PRS to the TG. The TG drive, TG CMU and the shearer were checked internally for gas and the incident site was then cleared by the Undermanager in consultation with the Underground Mine Manager. Production then recommenced at 5:30pm.
- The Longwall was at 2404m chainage at the time of the gas event
- There was 72m<sup>3</sup>/s ventilation across the longwall face.
- SO670A goaf well was in standby mode due to high oxygen



# HPI SUMMARY

## *Contributing Factors / Causes from LFI report*

### Organisational

- Rates of retreat vs gas drainage capabilities

### Task / Environmental Conditions

- Goaf
- Adjacent goaf present
- Close proximity of GML seam (0.2 to 0.3 meters)
- GP1, Ptuff, GPO within 6m of the GM seam roof (7.5m from cut roof)
- Floor heave

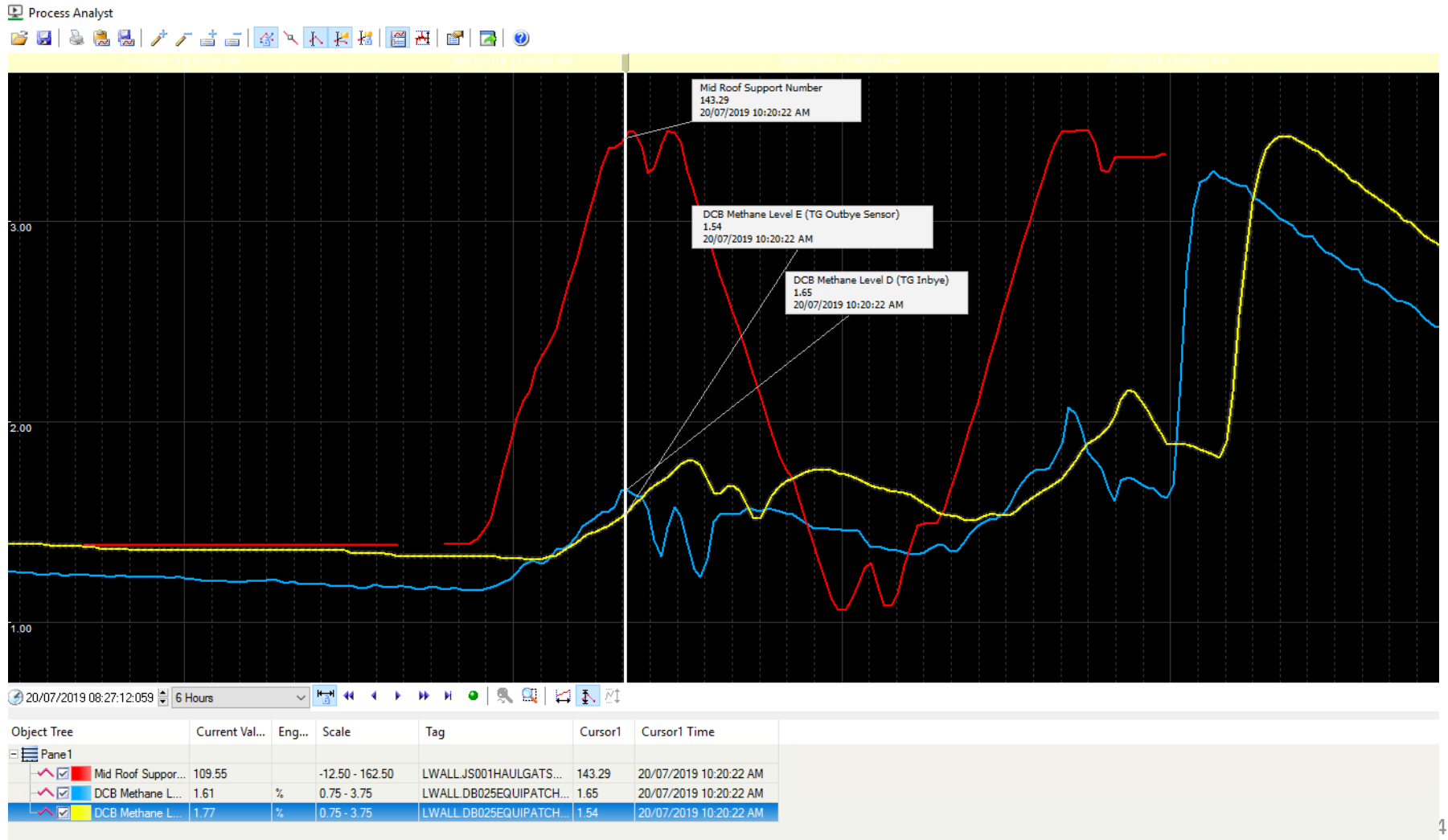
### Absent / Failed Defences

- Goaf well SO670A on standby due to low methane content until after the goaf event

# HPI SUMMARY

## Gas Trends for the shift

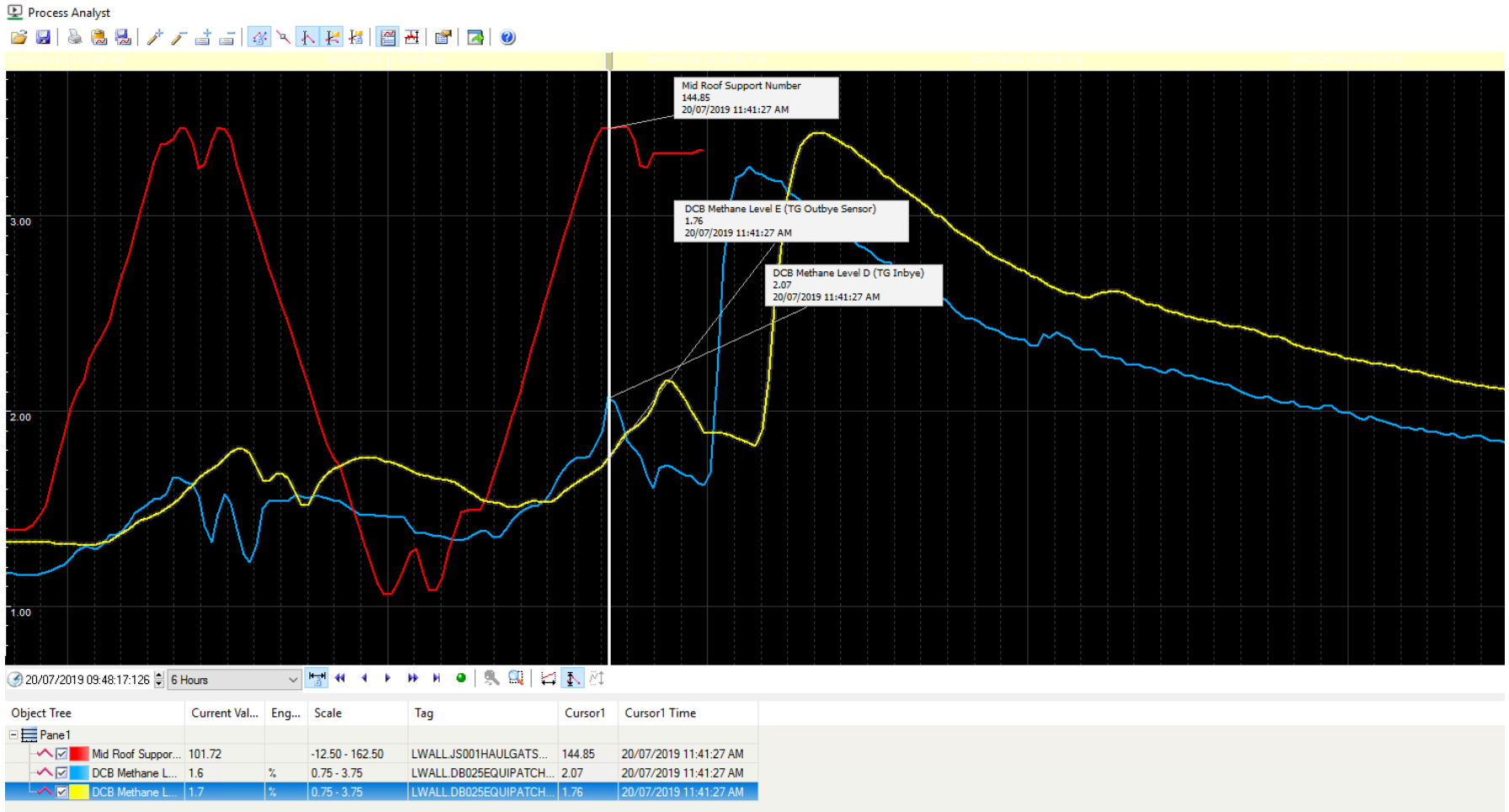
- First shear of the shift the TG IB sensor peaks at 1.65% methane



# HPI SUMMARY

## Gas Trends for the shift

- The second shear the shearer flush raises the level at the TG IB sensor to a peak of 2.07% methane



# HPI SUMMARY

## Gas Trends for the shift

- At 11.59 am the floor gas releases. The TG drive sensor fails (Green)



# HPI SUMMARY

## Gas Trends for the shift

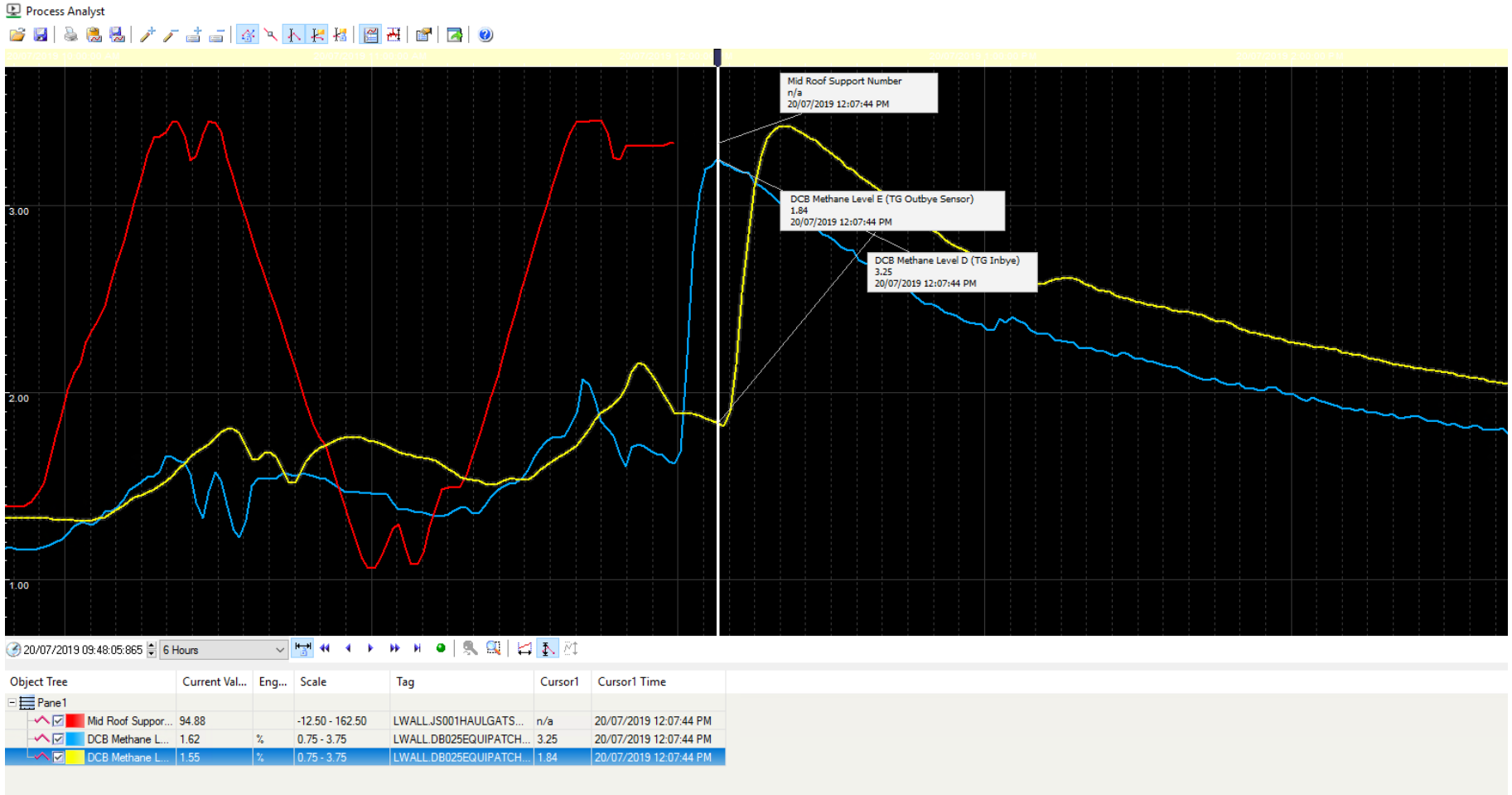
- The TG IB sensor sees the GB gas levels exceed 2.5% at 12.02 pm



# HPI SUMMARY

## Gas Trends for the shift

- 12:07 pm the TG IB sensor peaks at 3.25% CH4

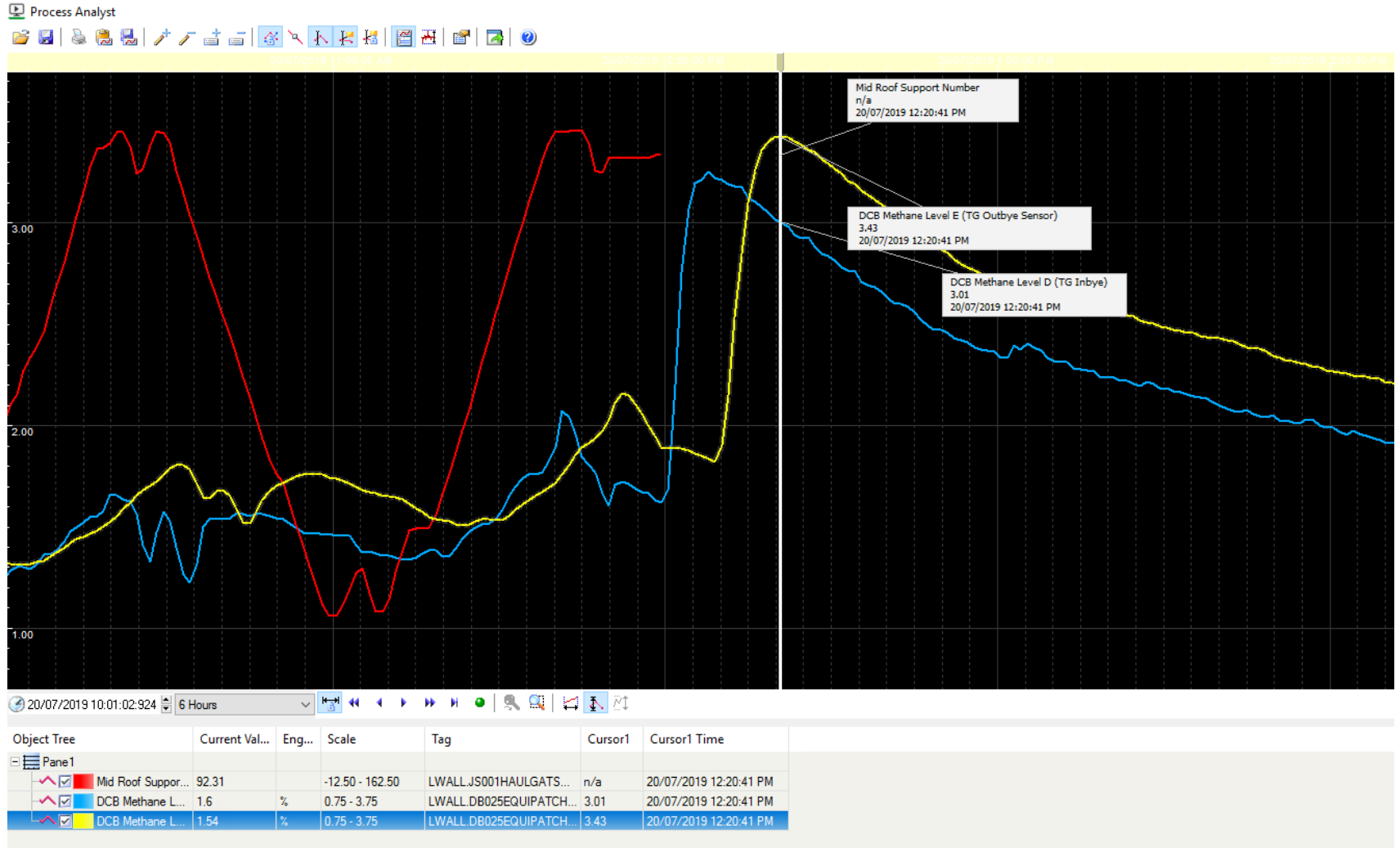




# HPI SUMMARY

## Gas Trends for the shift

- 13 minutes later the TG OB sensor peaks at 3.43% CH4



# HPI SUMMARY

## Gas Trends for the shift

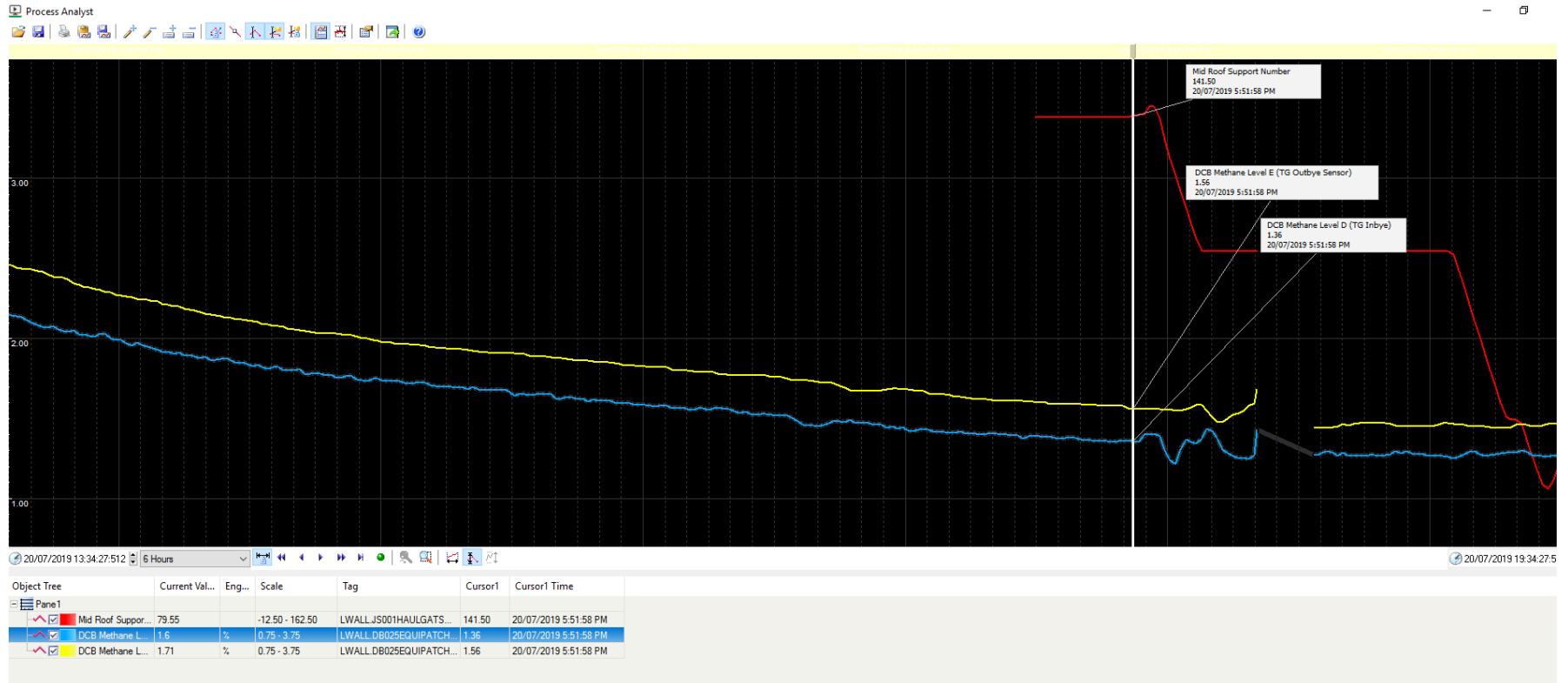
- 12:47 pm the IB sensor returns readings below 2.5% CH4 with the OB sensor following suit at 13:29.



# HPI SUMMARY

## Gas Trends for the shift

- Production resumes at 17:51 with TG CH4 levels having returned to normal at 1.36%



# HPI SUMMARY

## Preventative actions / recommendations

Revise the UIS strategy in similar areas to ensure adequate drainage of the GML

- In 2019 there was minimal experience in drilling and draining the GML seam. The drilling contractor (Radco) had attempted to drill in the GML previously with limited success. The UIS floor touch strategy was implemented to drain the gas from the GML seam.

	Total Drilled Metres	GML metres	GM metres	GML Cost	GM Cost
LW605	60,961	6,199	54,763	\$ 750,019	\$ 6,626,263
LW606	55,155	15,538	39,617	\$ 1,880,098	\$ 4,793,597
LW113	9,070	3,360	5,710	\$ 406,560	\$ 690,910
Total	125,186	25,097	100,089	\$ 3,036,677	\$ 12,110,769

- In 2020 GML cross block candelabra drilling was trialed from MG605 across LW606. This was successful and has been implemented from 2020 to assist in draining the GML

Revise the Degassing the purging procedure to ensure specific to longwall operations

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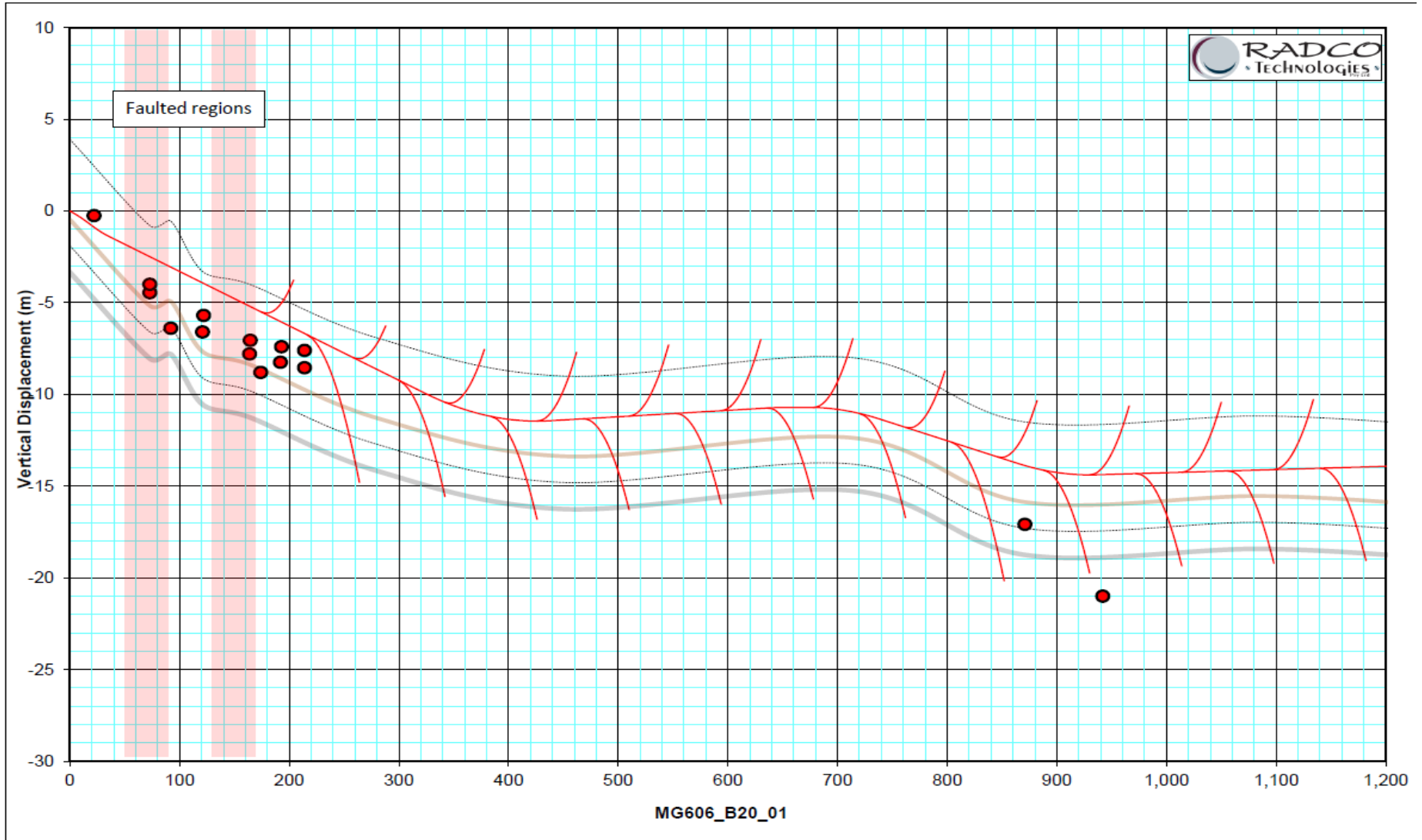
Review the geotechnical goaf caving around TG604 with adjacent goaf

- Review of historical goaf hole performance undertaken by Seamgas found ~25m from rib was optimal position for purity and flow rates
- Numerical modelling conducted by CSIRO to review optimal positioning for the vertical goaf drainage wells to prevent impact of shear from caving / subsidence identified the ~25m position was adequate.
  - Report No. EP198160 Numerical assessment of goaf-hole instability at Moranbah North Mine January 2020. CSIRO*

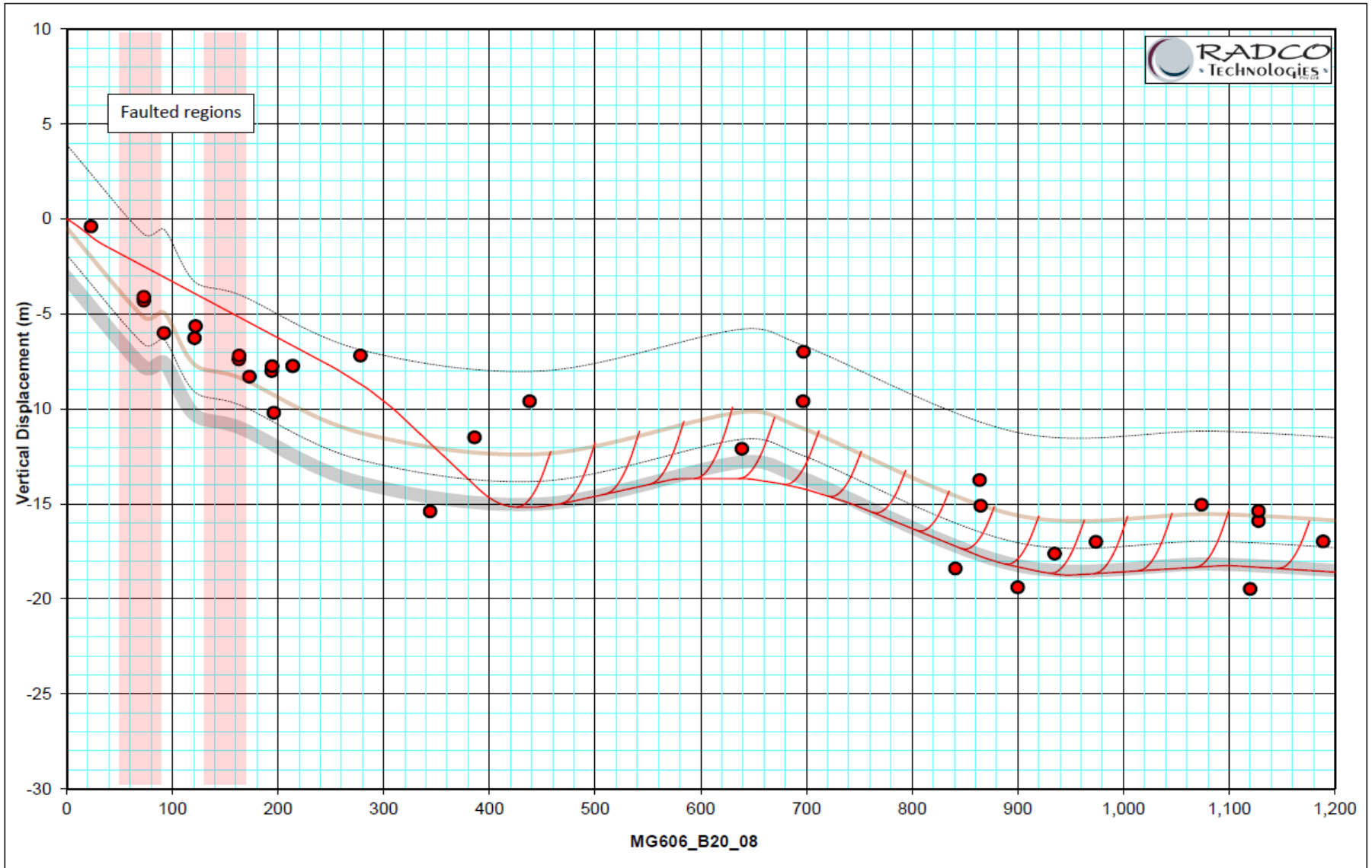
Review the GML gas content to ensure drainage strategy is effective.

- The UIS GML floor touch strategy has effectively drained the GML in LW605 too ~ half the virgin content. Borehole Gas content test records illustrate the effectiveness of the drainage.

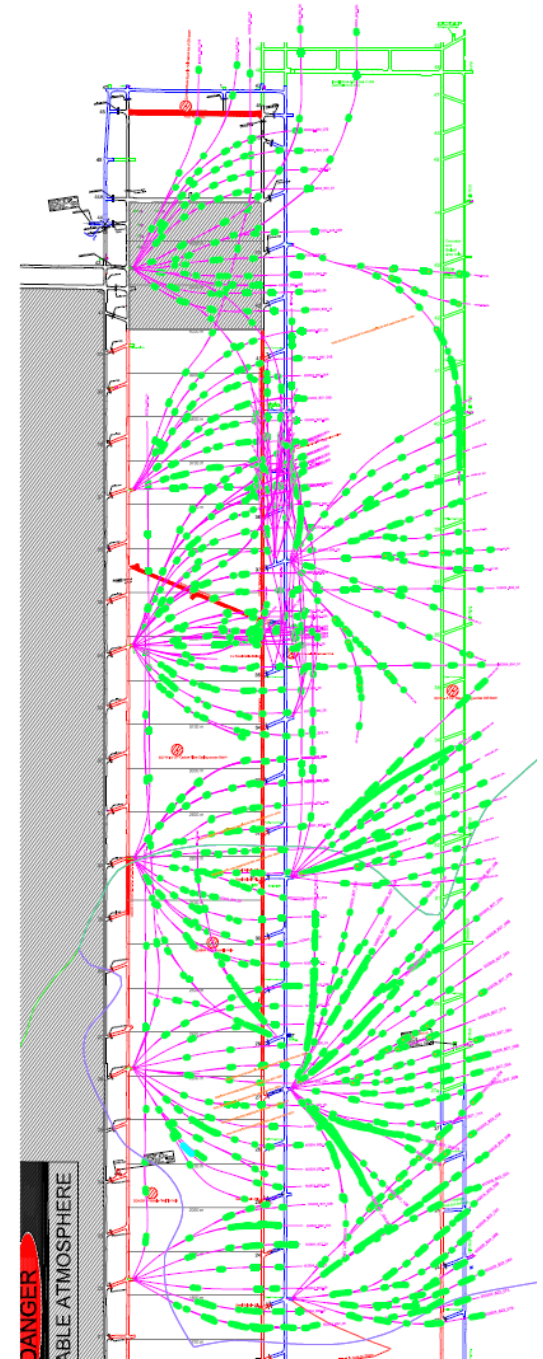
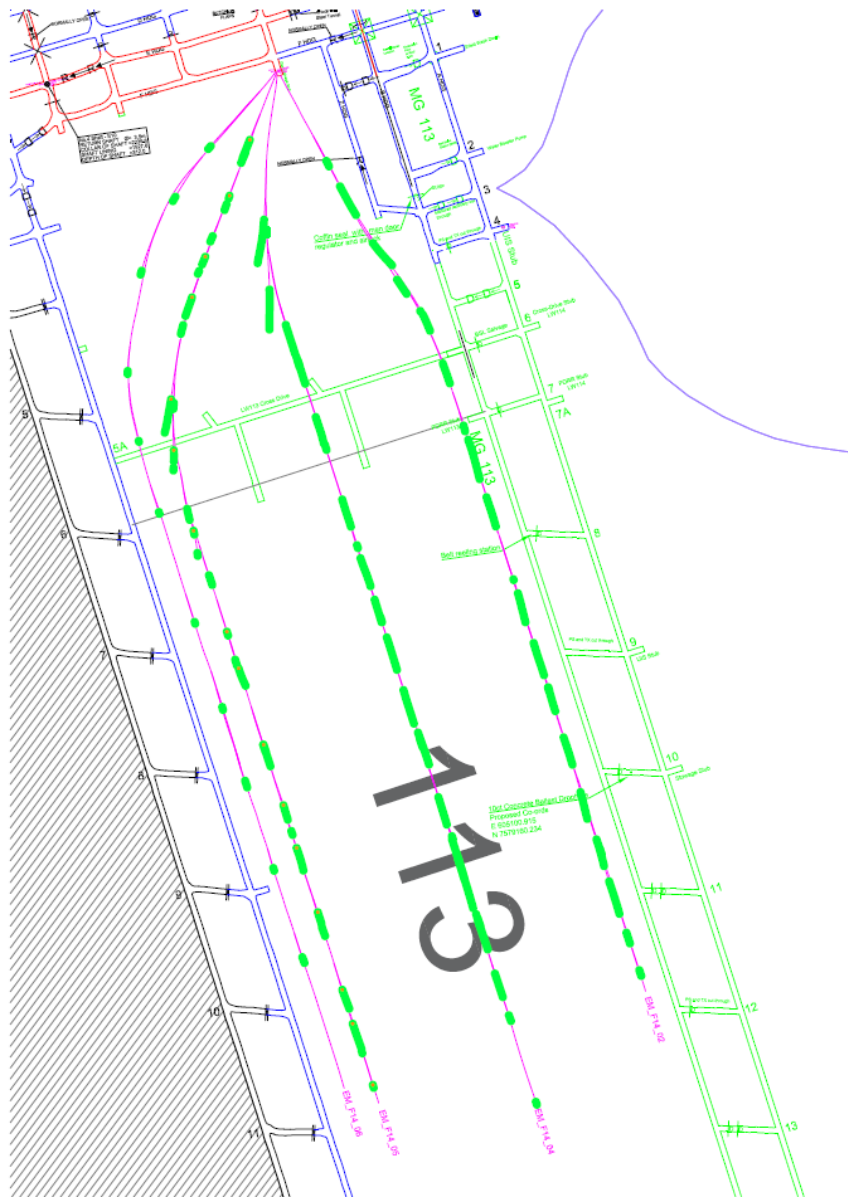
# UIS DRAINAGE DESIGN GML FLOOR TOUCH



# UIS DRAINAGE DESIGN GML TARGETED HOLE

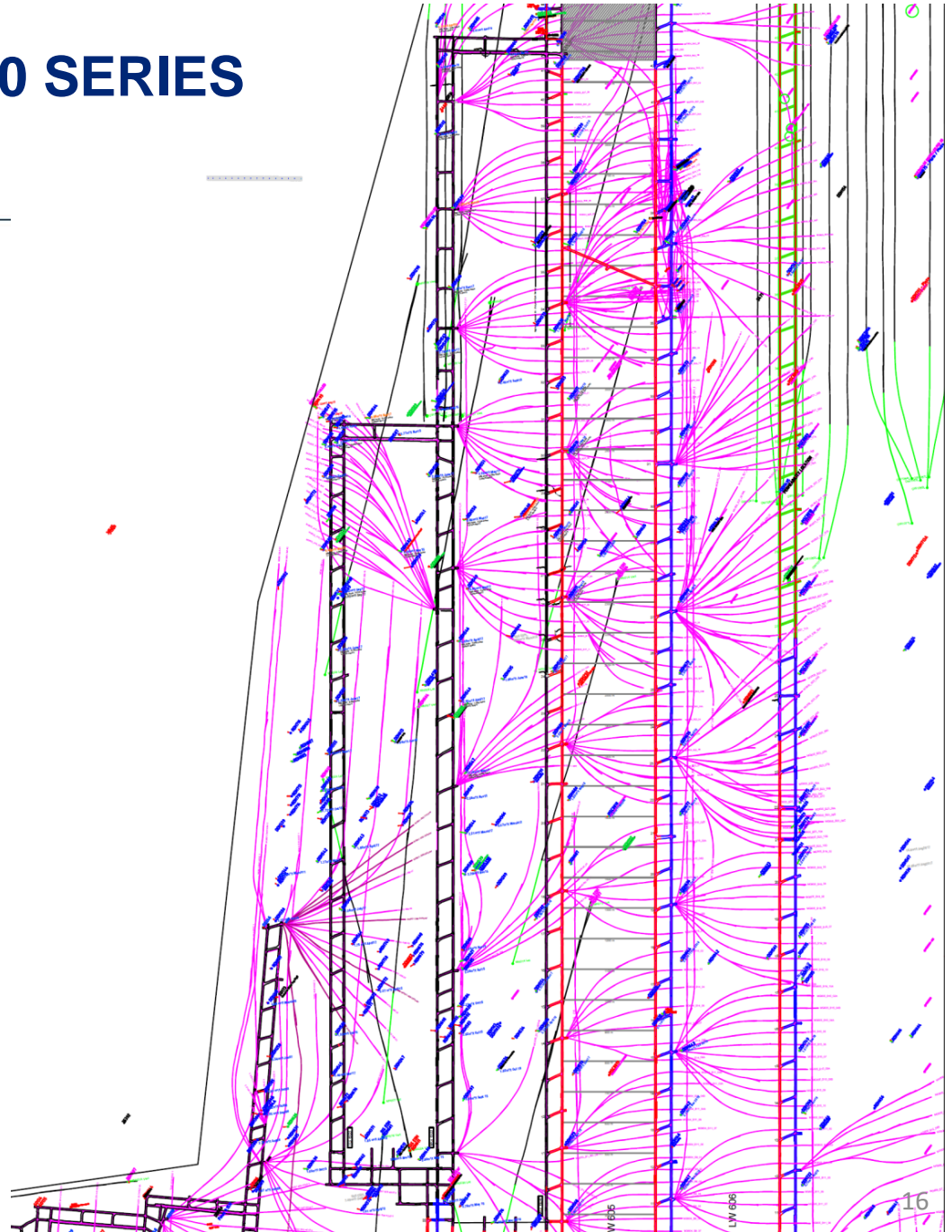


# ACTUAL GML DRAINAGE TO DATE





# UIS DRAINAGE FOR 600 SERIES





# BOREHOLE GAS CONTENT RESULTS

Borehole	Virgin GML gas content m <sup>3</sup> /t	Drained Gas Content m <sup>3</sup> /t
DDH778 44Act LW605	~10.0	1.41
DDH617 33-34ct LW605	~10.0	1.83
MSC0003 28-29ct LW605	~10.0	2.27
MSC0001 24ct MG606	~10.0	5.87
MSC0002 25-26ct MG606	~10.0	3.13
MSC0008 27-28ct MG606	~10.0	3.97
MSC0025 36ct MG606	~10.0	3.88
DDH686 32ct MG605	~10.0	4.46
DDH673 33-34ct MG605	~10.0	5.95
DDH714R 35ct MG605	~10.0	5.07
DDH720 37ct MG605	~10.0	3.12
DDH705 40ct MG605	~10.0	5.86
DDH706 41ct MG605	~10.0	4.45
DDH717 45ct MG605	~10.0	3.56
DDH716 47ct MG605	~10.0	4.08
DDH767 48-49ct MG605	~10.0	4.15