



JULY 2026

SNOWY 2.0 **PUMPED HYDRO PROJECT** **MARICA UPSTREAM SURGE SHAFT**

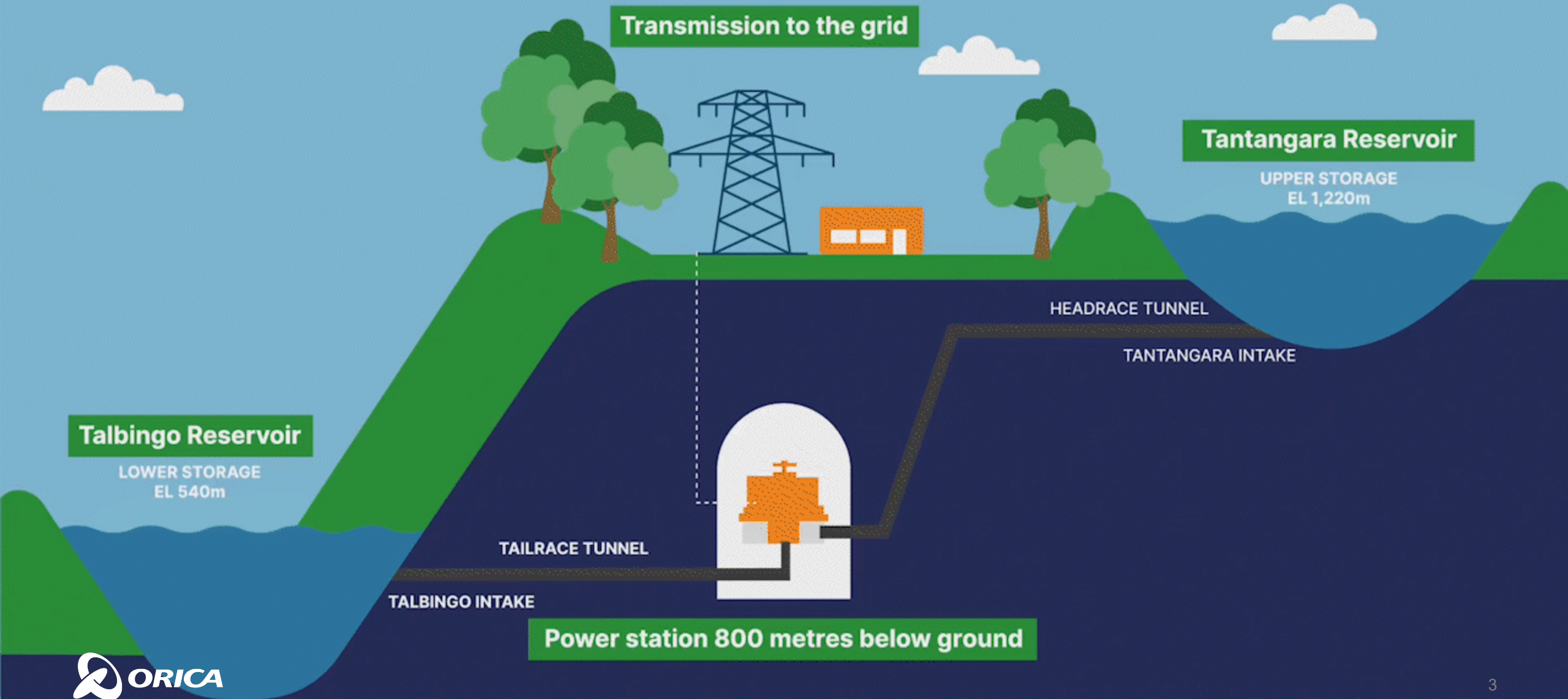


Rob Domotor – Manager Global Technical Services Excellence, Orica

The Snowy Hydro Story



Project Overview



Future Generation JV



ORICA

AT A GLANCE

150

YEARS OF
INNOVATION



MORE THAN
15,000
EMPLOYEES

250+

TECHNOLOGISTS



CUSTOMERS IN
MORE THAN

100

COUNTRIES

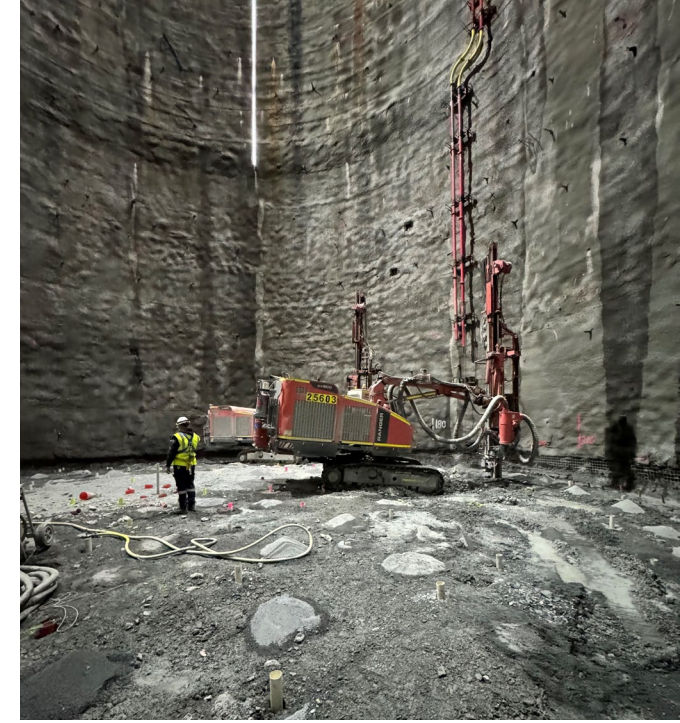
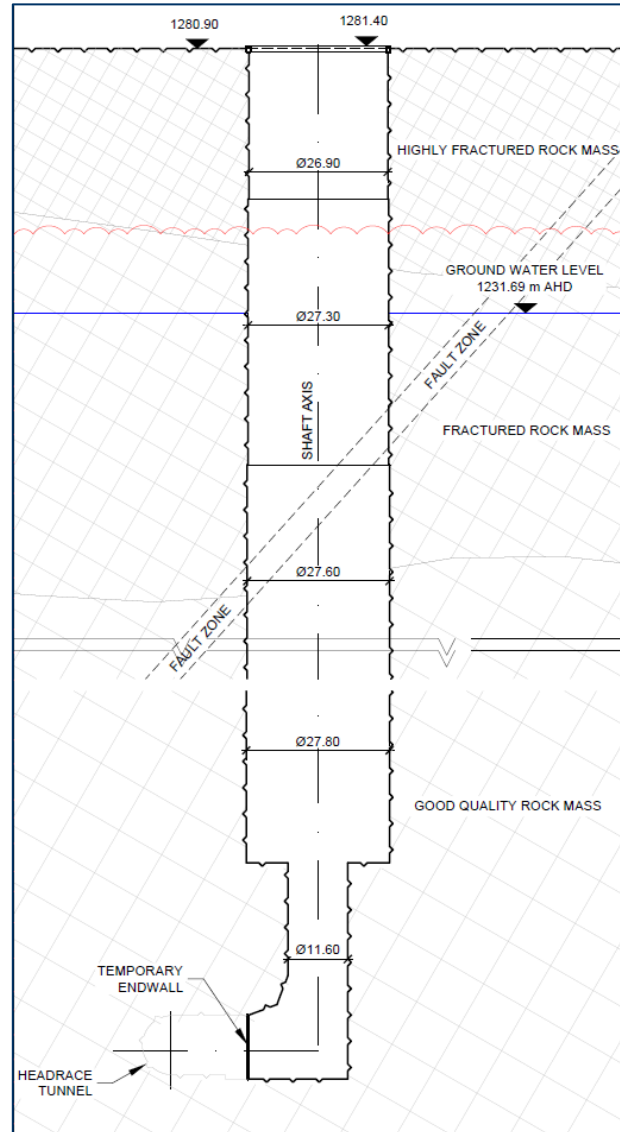
8

MAJOR TECHNICAL
CENTRES

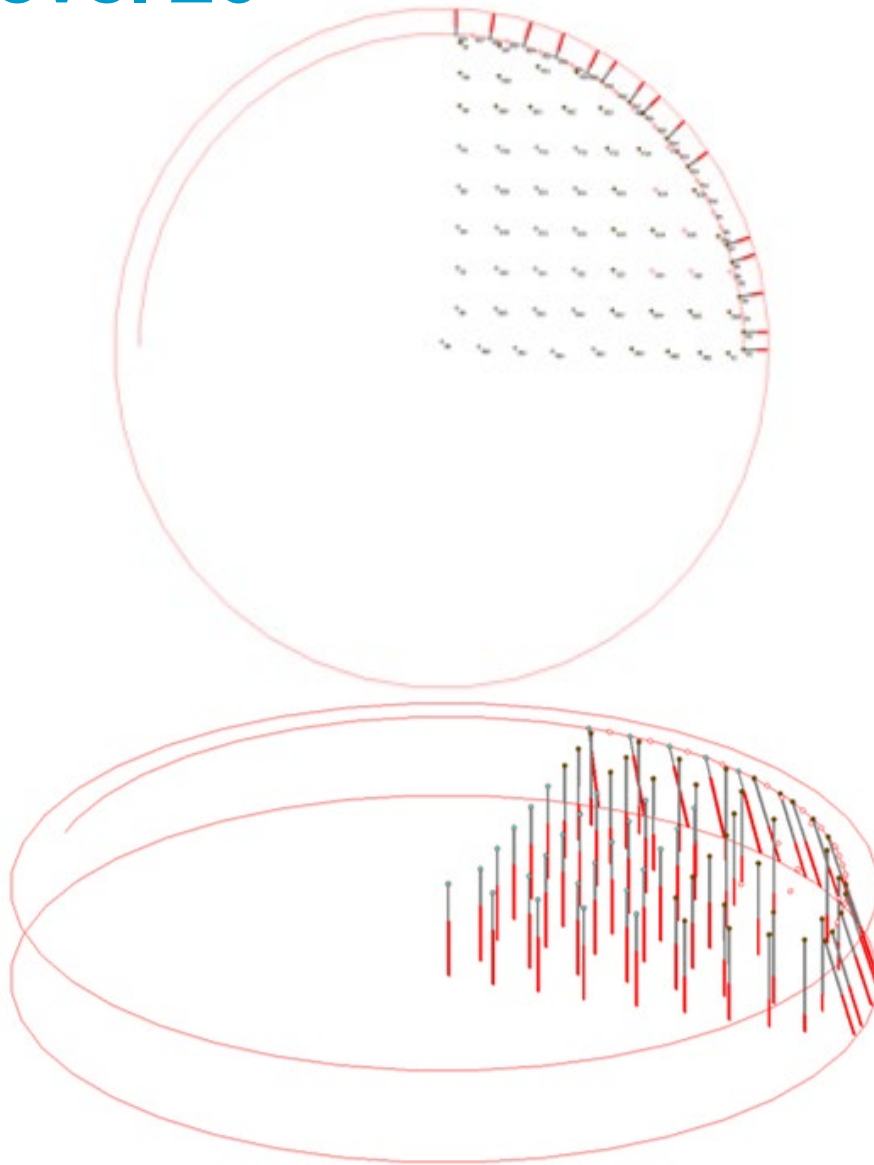




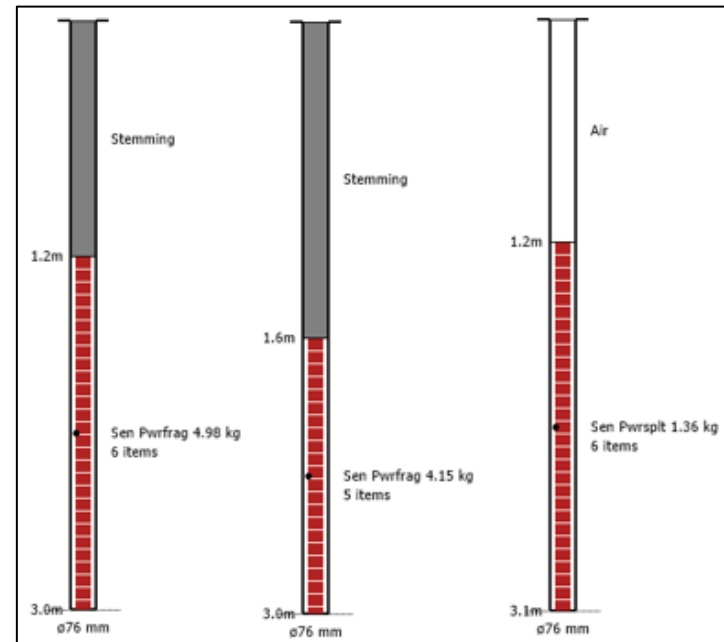
Marica Shaft



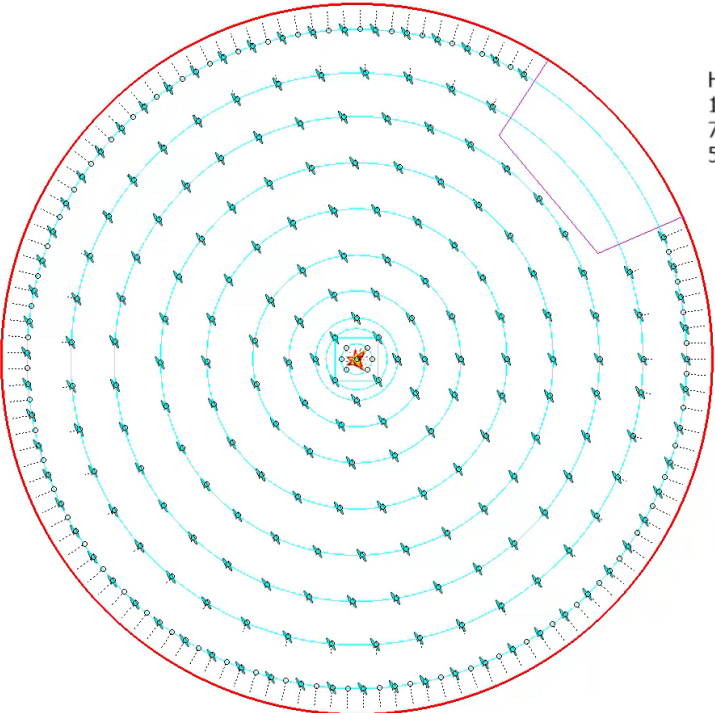
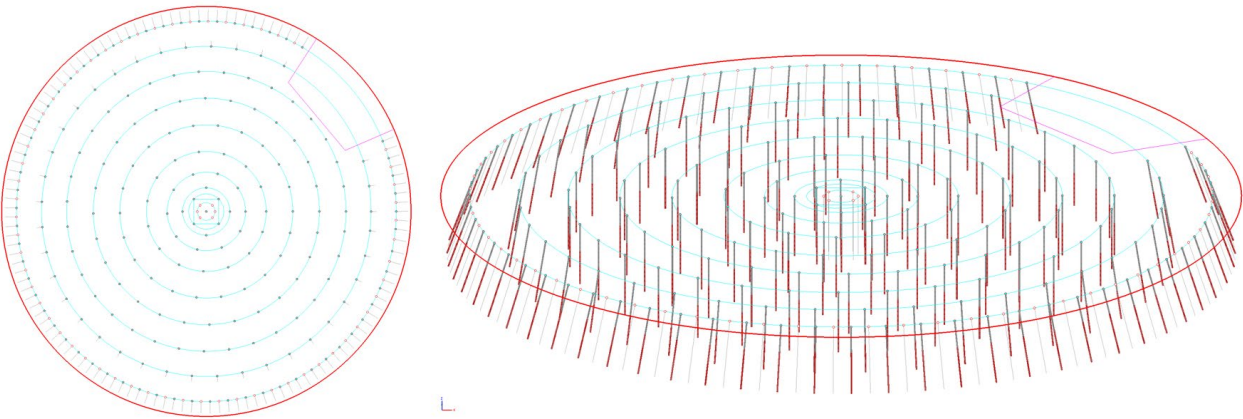
Blast Level 26



Level 26 Pattern Parameters	
Holes	87
Blast hole Diameter	76mm & 51mm
B x S	1.6 x 1.6
Depth	3.0m
Explosive	Packaged 55mm & 26mm
Pattern	Square
Vibration Limit	100mm/s

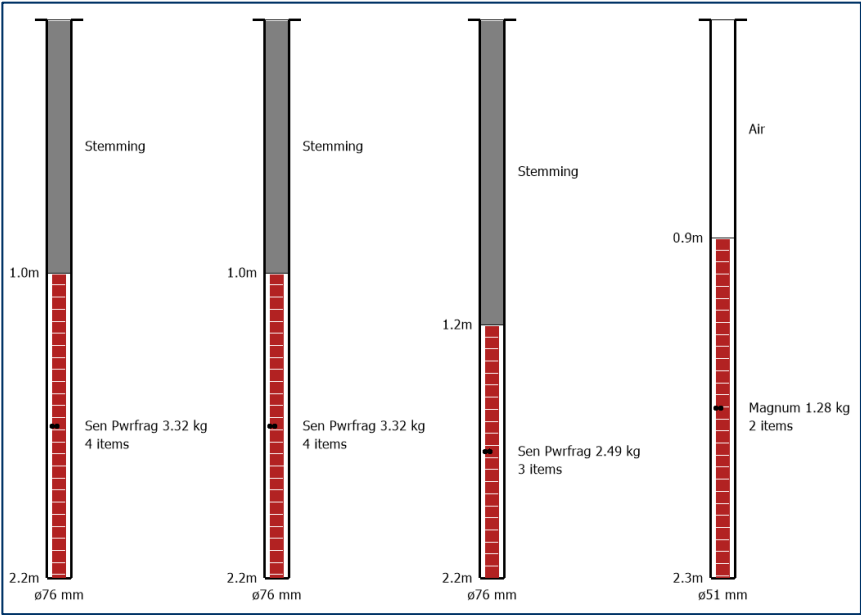


Blast Level 46



Hole Diameters
102mm Reamers
76mm Production Holes
51mm Perimeter Holes

Level 46 Pattern Parameters	
Holes	281
Blast hole Diameter	76mm & 51mm
Cut Type	102mm Revolver
B x S	1.8m x 1.7m
Depth	2.2
Explosive	Packaged 55mm & 26mm
Pattern	Ring
Vibration Limit	100mm/s



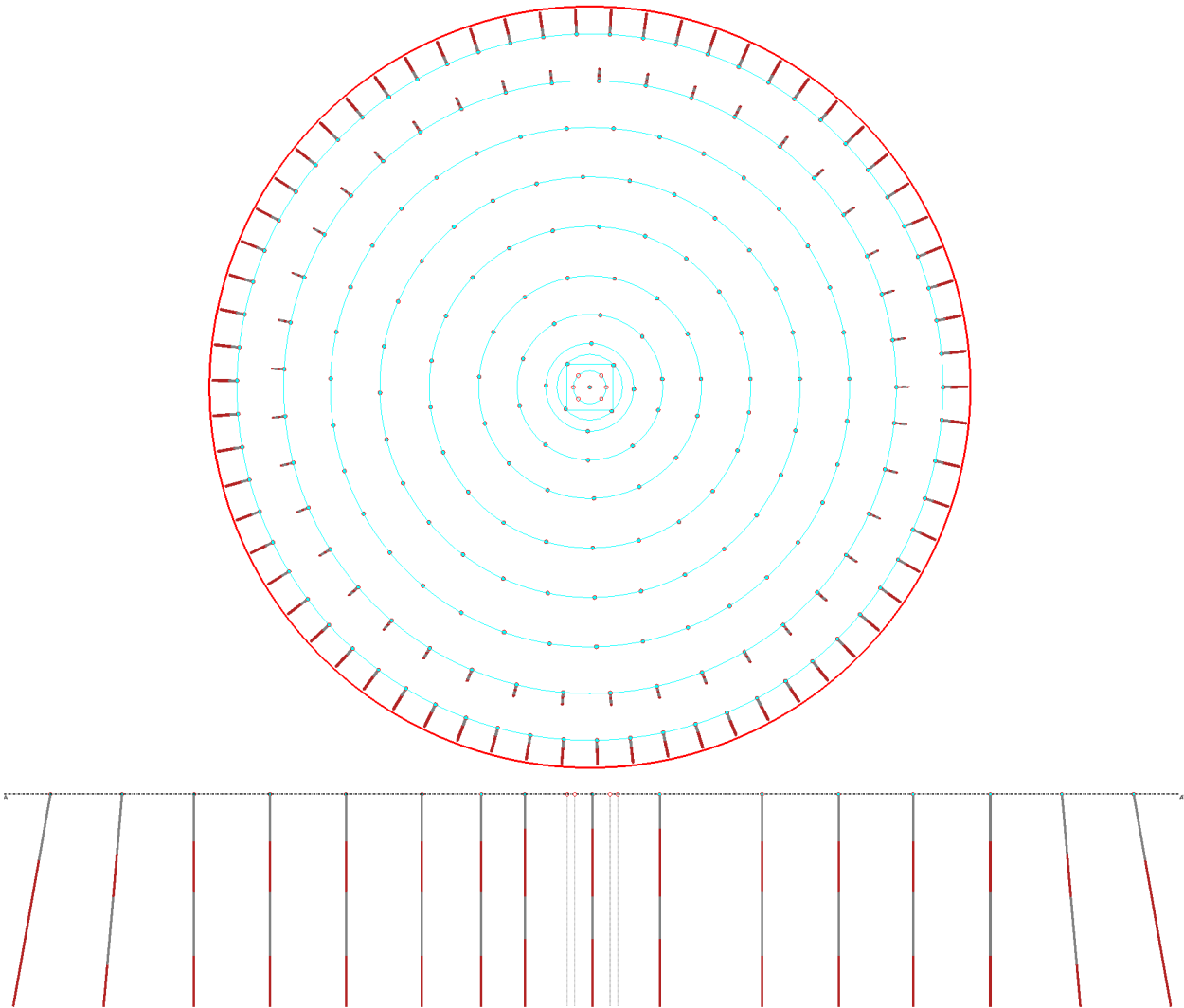
Blast Level 46



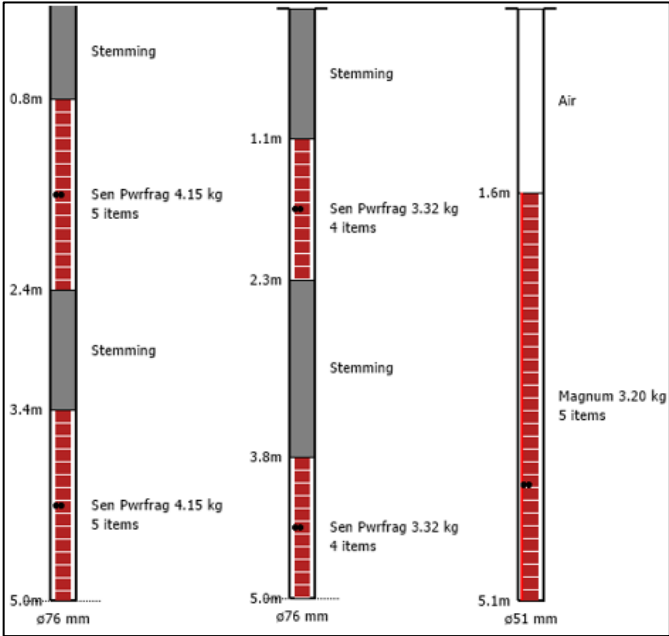
Blast Depth Increase



Blast Level 49 & 50

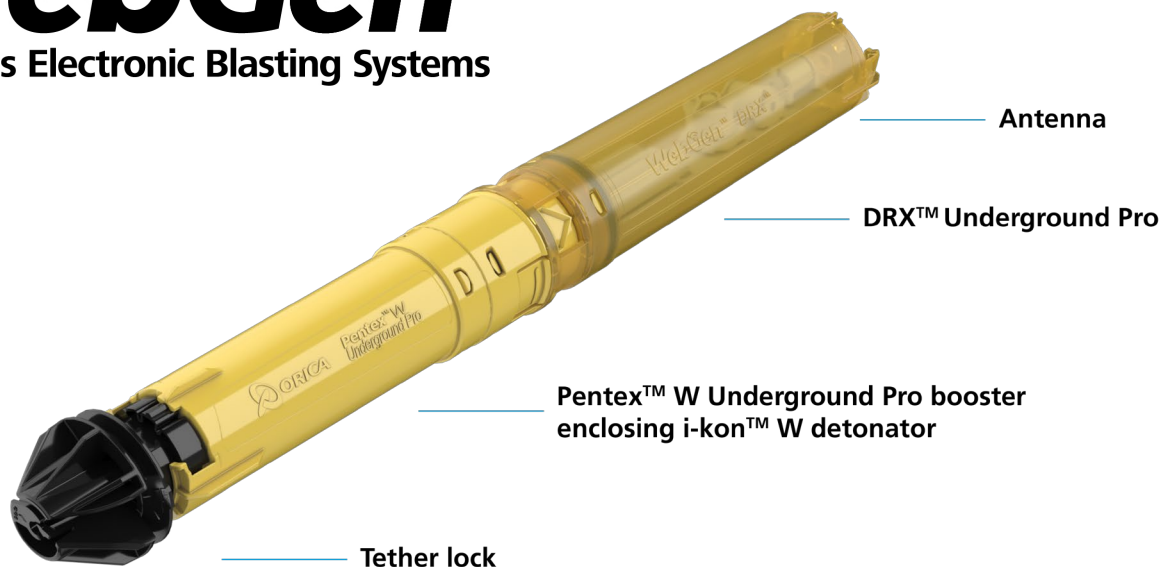


Level 46 Pattern Parameters	
Holes	281
Blast hole Diameter	76mm & 51mm
Cut Type	102mm Revolver
B x S	1.8m x 1.7m
Depth	2.2
Explosive	Packaged 55mm & 26mm
Pattern	Ring
Vibration Limit	100mm/s



Exploring Technology Options

WebGen™
Wireless Electronic Blasting Systems



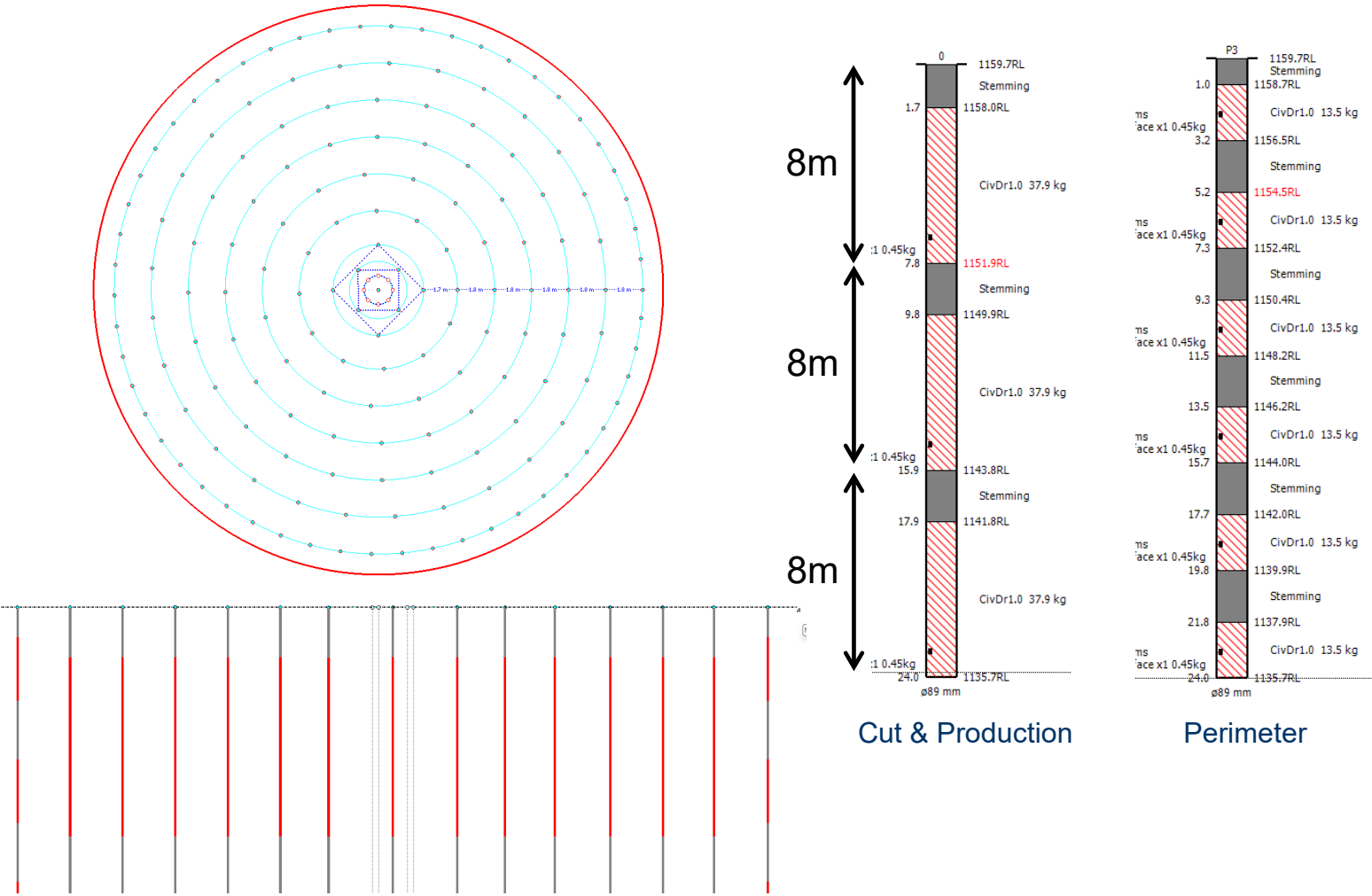
KEY FEATURES

- i-kon™ detonator
- Pentex™ booster 454g
- Near-Field Comms (NFC) Encoding
- Up to 60 days in-hole sleep time
- Water resistant to 8 bar static pressure

Wireless communication through Rock, Air, and Water to initiate Blastholes reliably and safely

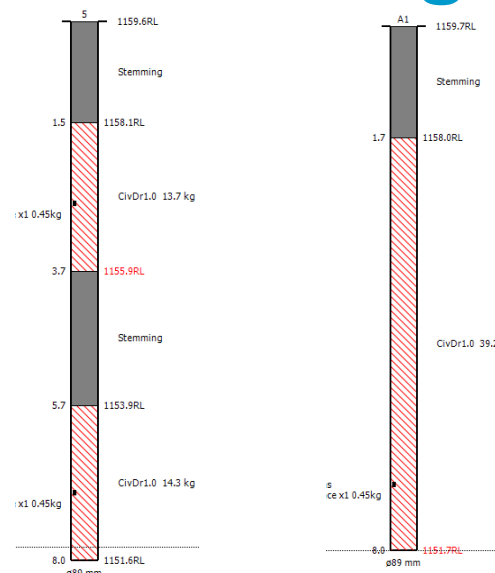
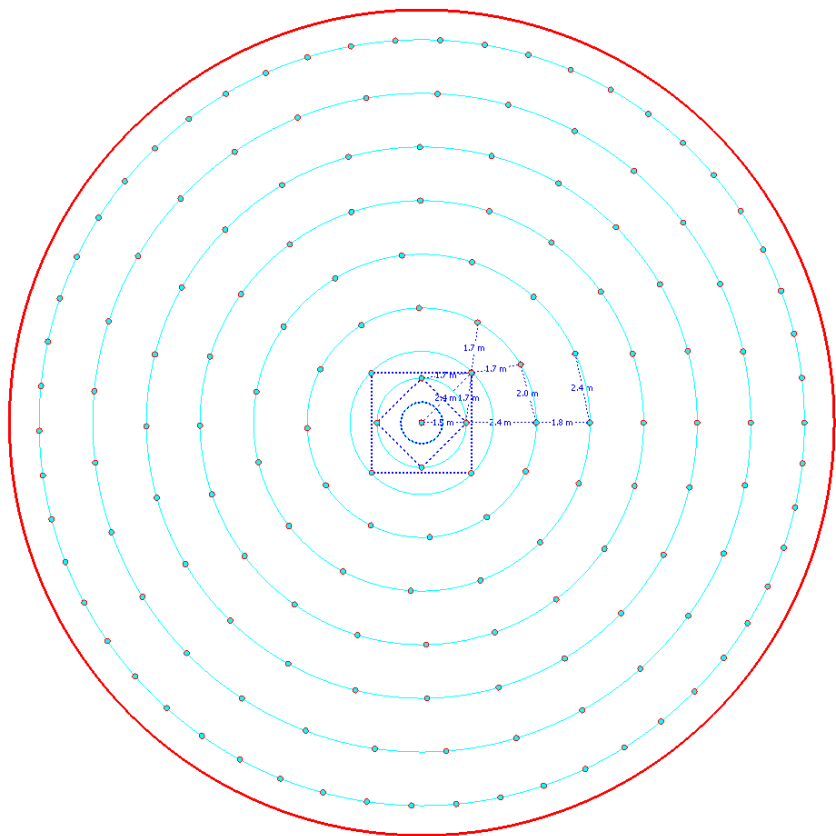


Marica Shaft – WebGen™ Concept



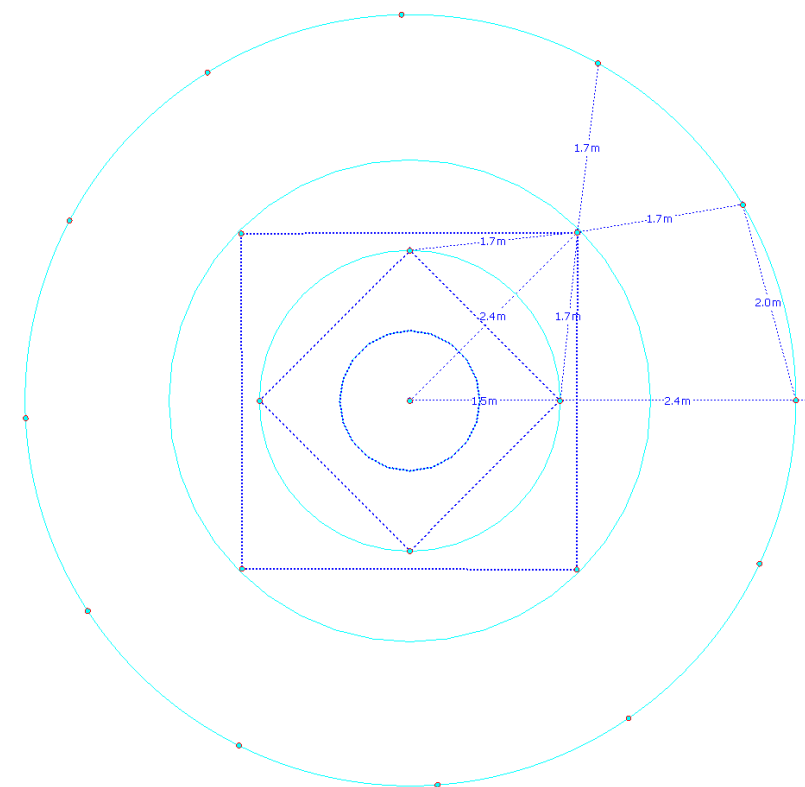
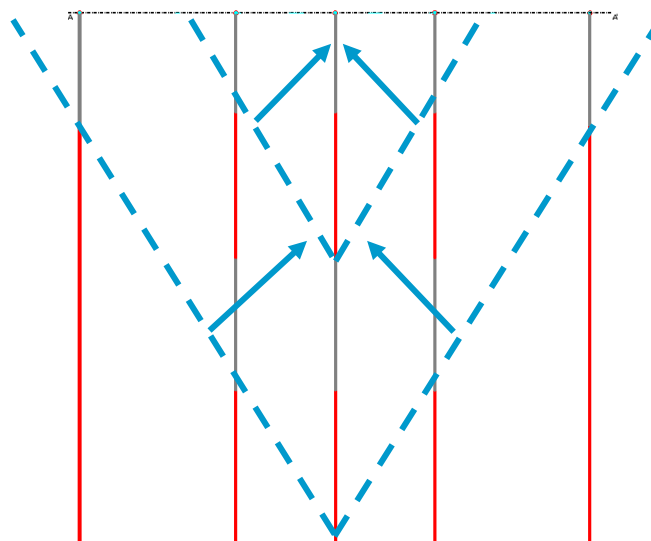
WebGen Pattern Parameters	
Holes	155
Blast hole Diameter	89mm
Charge weight	~38kg
B x S	1.8m x 2.5m
Depth	24m
Explosive	Emulsion
Pattern	Ring
Vibration Limit	250mm/s

Marica Shaft – WebGen™ Cut Design Alternative



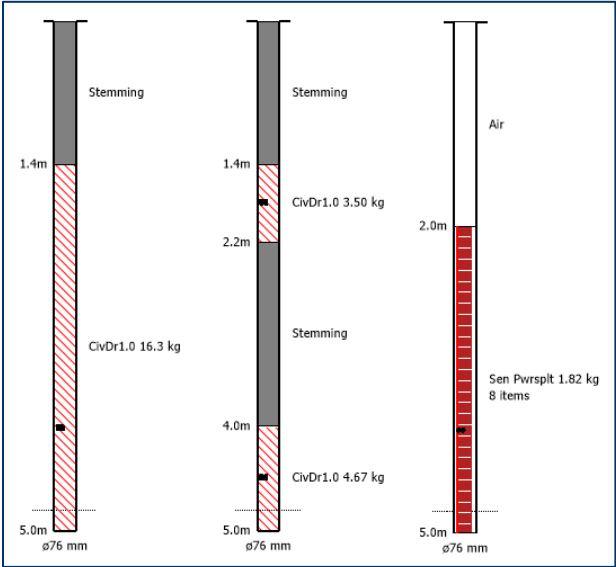
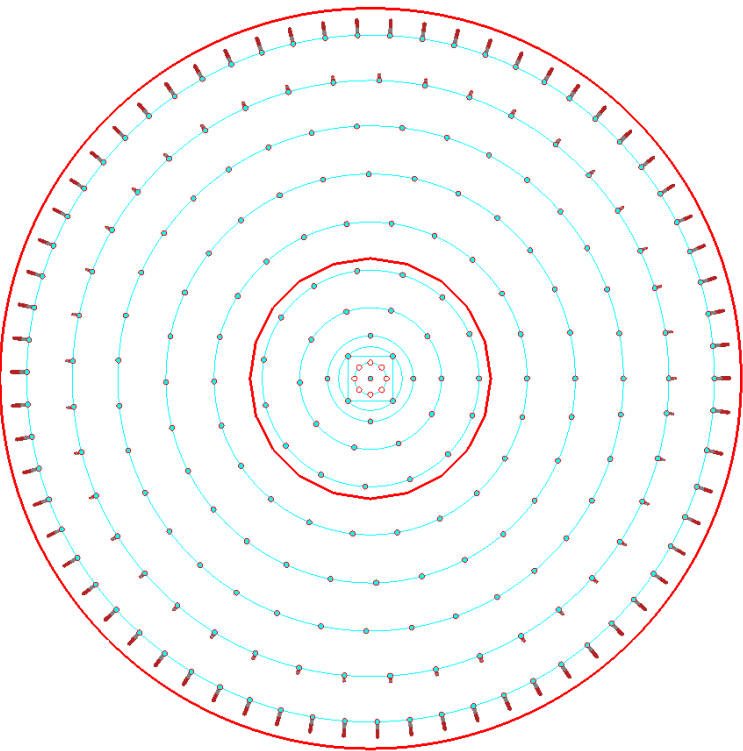
Cut

Production

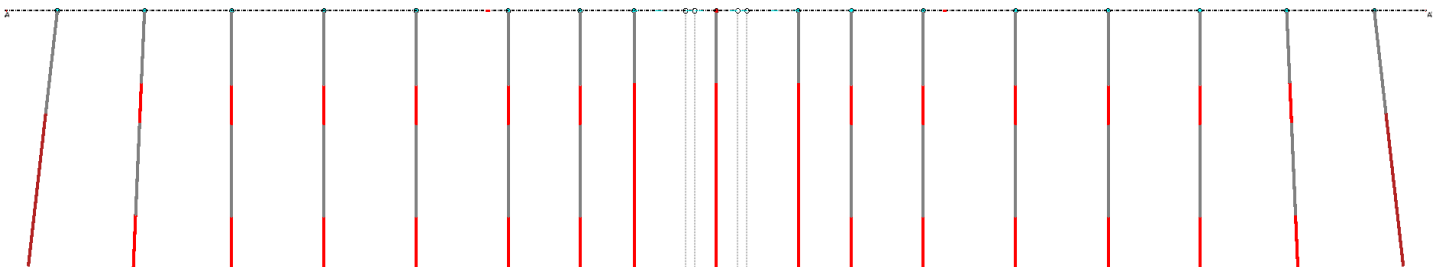


Cut design – no reamers

Blast Level 51 & 52 Transition to Emulsion



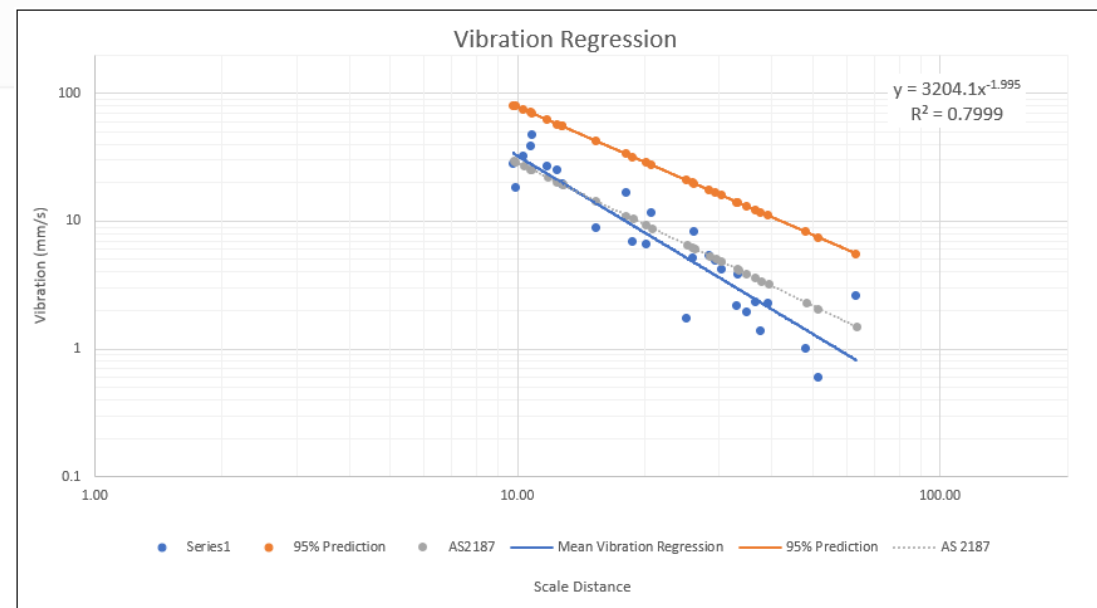
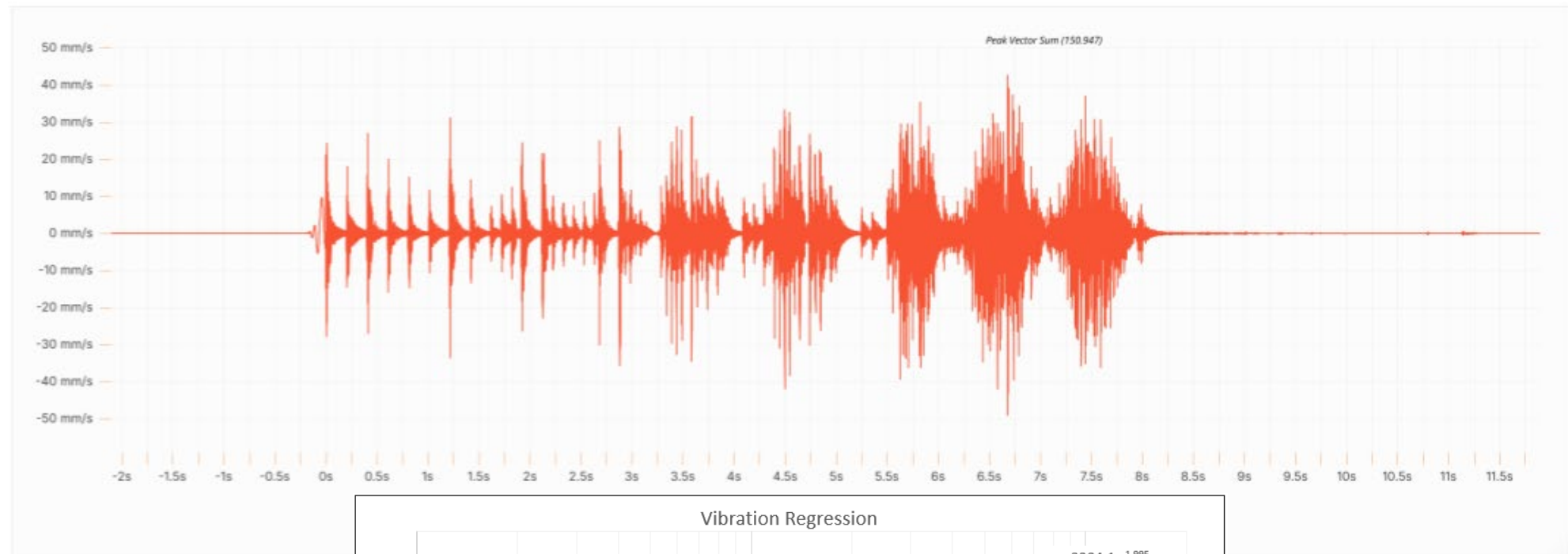
Level 51 & 52 Pattern Parameters	
Holes	293
Blast hole Diameter	76mm & 51mm
Cut Type	102mm Revolver
B x S	1.8m x 1.8m
Depth	5.0m
Explosive	Emulsion and Packaged 26mm
Pattern	Ring
Vibration Limit	100mm/s



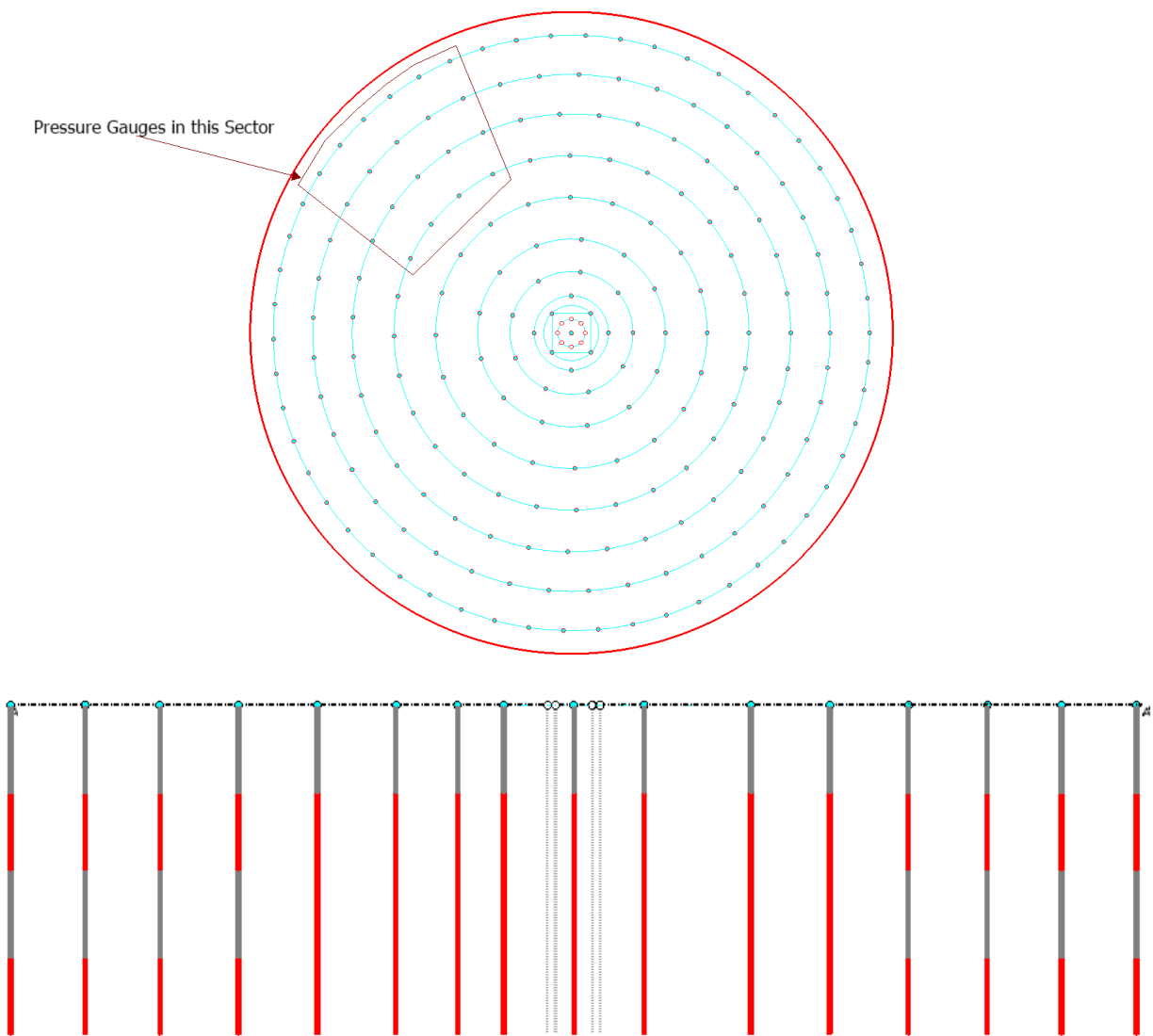
Blast Level 51, 52



Blast Vibration Review



Blast Level 55, 56, 57

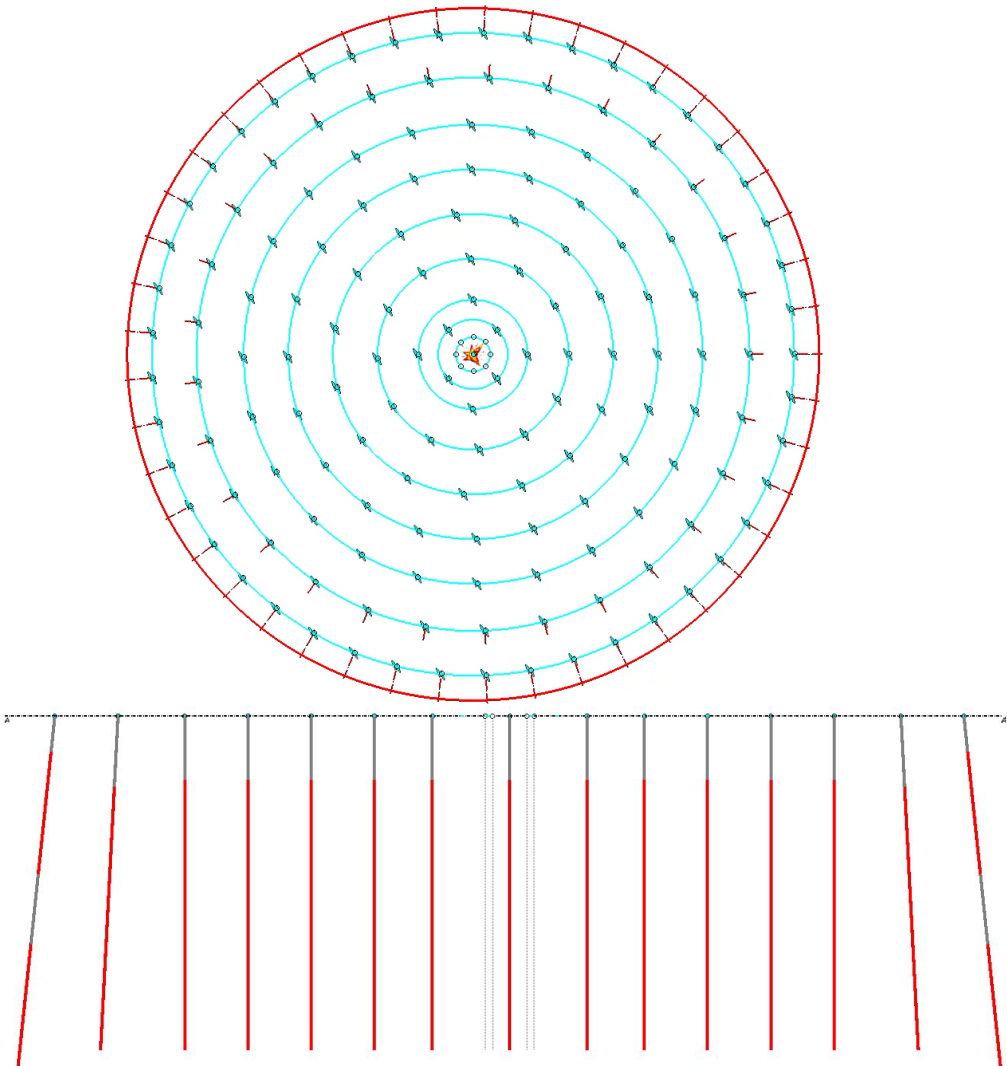


Level 55, 56, & 57 Pattern Parameters	
Holes	217
Blast hole Diameter	76mm
Cut Type	102mm Revolver
B x S	1.8m x 1.8m
Depth	7.5m
Explosive	Emulsion
Pattern	Ring
Vibration Limit	250mm/s

The diagram shows three vertical profiles of blast holes, each with a diameter of 76 mm. The profiles are labeled with dimensions and explosive charges:

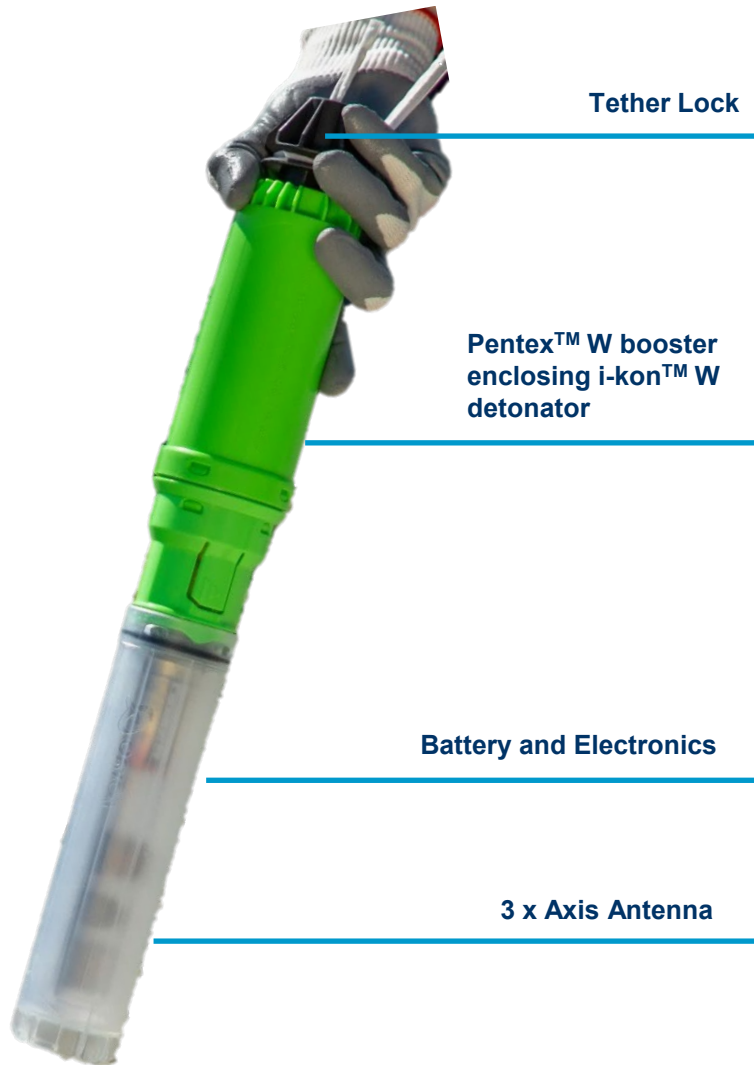
- Profile 1 (Left):** Total depth 7.5m. Stemming (grey) at the top, 2.0m. Explosive charge (red hatched) below, 5.5m. Total explosive charge: CivDr1.0 25.0 kg.
- Profile 2 (Middle):** Total depth 7.5m. Stemming (grey) at the top, 2.0m. Explosive charge (red hatched) below, 1.8m. Stemming (grey) below, 3.8m. Explosive charge (red hatched) below, 1.8m. Total explosive charge: CivDr1.0 7.94 kg.
- Profile 3 (Right):** Total depth 7.5m. Stemming (grey) at the top, 2.0m. Explosive charge (red hatched) below, 1.8m. Stemming (grey) below, 3.8m. Explosive charge (red hatched) below, 1.8m. Total explosive charge: CivDr1.0 7.94 kg.

Blast Design Step Change



Level 70, 71, & 72 Pattern Parameters	
Holes	154
Blast hole Diameter	89mm
Cut Type	102mm Revolver
B x S	1.8m x 2.3m
Depth	9.5m
Explosive	Emulsion
Pattern	Ring
Vibration Limit	250mm/s

Wireless Blasting Review



Successful Blasting: Increased vibration limit and improved advance rates using 89 mm holes and 9 m triple-bench designs at the Marica Shaft.

WebGen™ Evaluation: Single-pass drilling and loading with WebGen™ was proposed to reduce crane lifts, drilling mobilizations, and service disconnections, saving time and reducing risks.

Decision to Defer: Strong results from bulk emulsion and larger holes led to deferring WebGen™ at Marica, though testing confirmed its feasibility.

Future Application: WebGen™ designs remain valid for future Snowy 2.0 phases, like the Downstream Surge Shaft and Trifurcator Breakthrough.

Overall Efficiencies



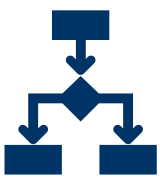
Project Objectives: FGJV focused on safety, production, efficiency, and quality to deliver the upstream surge shaft within tight project milestones.



Blast Optimisation: Blast designs evolution minimised blast holes, reducing drilling and loading times, while multiple bench blasts in single campaigns cut cycles and high-risk crane lifts.



•**Outcomes:** Optimized designs, equipment upgrades, and operational planning enhanced production, reduced risks, and aligned shaft excavation with the project schedule.



•**Lessons Applied:** Insights from Marica's blasting campaign are being shared across the project, emphasising collaboration and continuous improvement in complex engineering.



THANK YOU!

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