TerraFirma
MINING LIMITED



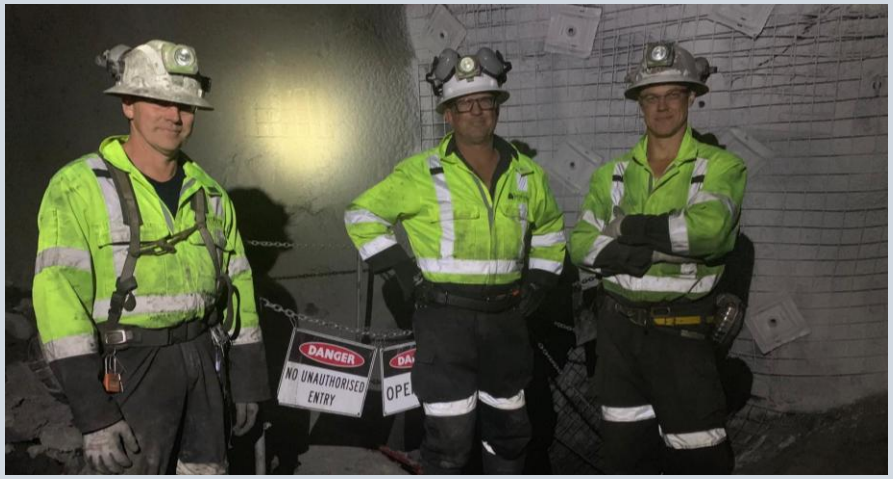
Spring Creek Mine Design

About us

Private New Zealand Company

- Established in 2013 with a vision to build and safely operate underground mining operations in New Zealand.
- Current team of approximately 40.
- Offices and workshops in Huntly and Reefton.











Projects & Contracts

Mt Baldy
- EP Historical Gold Mine – Springs Junction
- 1000m Exploration drilling planned

Spring Creek
- EP Low ash, low Sulphur, high vitrinite – Specialist Coal

Pebbly Hills
- EP Silica pebble deposit – Southland
- Silicon manufacturing planned in Southland 2029

Bald Hill JV
- Underground Gold – Cemented Alluvial deposit, in production

Mossy Creek
- Alluvial Gold – Under Evaluation (23/02/2026)

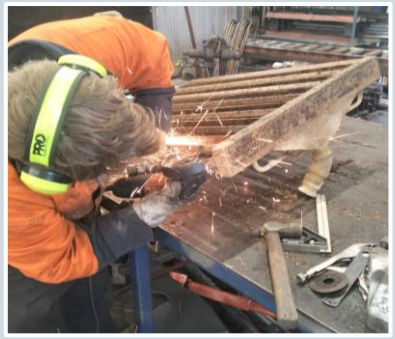
Auld Creek – Rua Gold
- Mine planning and engineering services
- Mine contractor

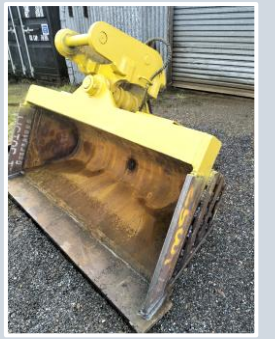
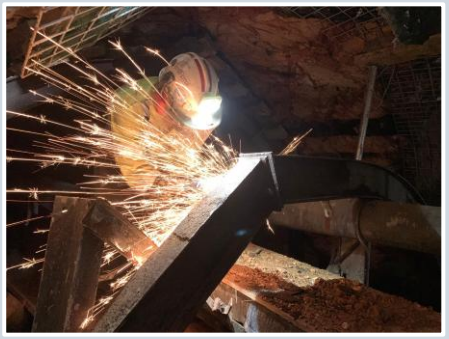
Waihi – Oceana Gold
- Underground Infrastructure (4 crews)
- Narrow Vein Mining Crew (2 crews)

Special Projects
- Mine and tunnel inspections
- Resin injection and water stopping
- Underground infrastructure installations



REEFTON ENGINEERING







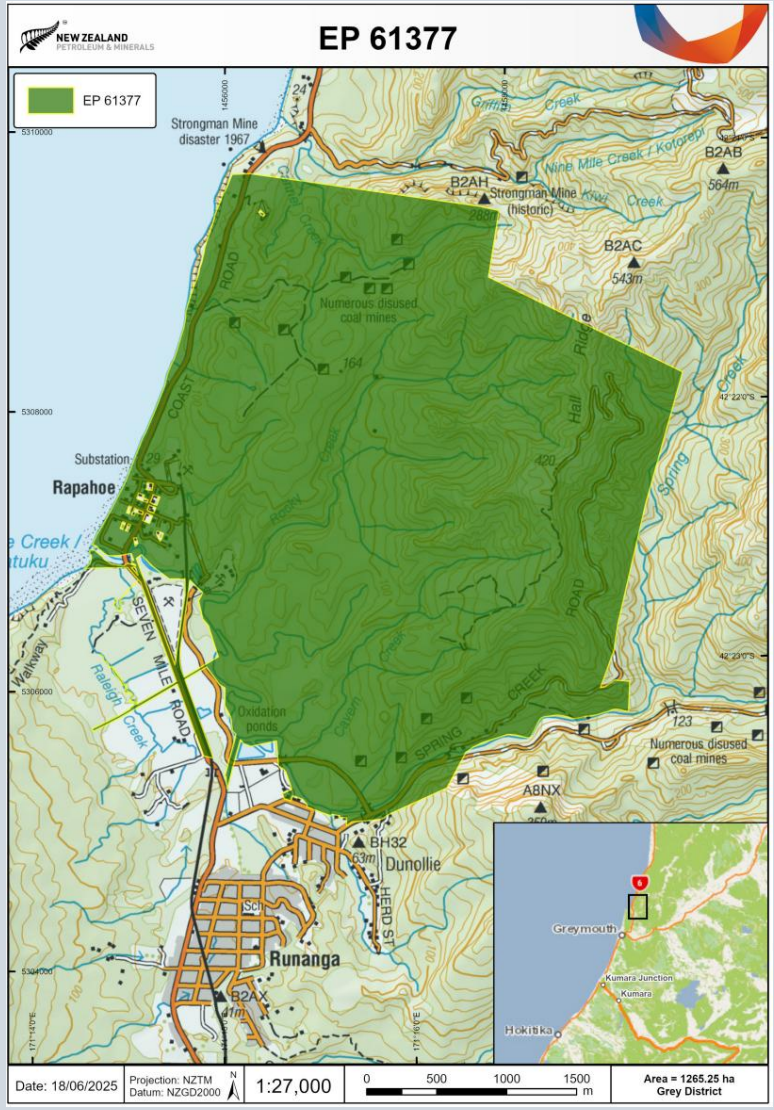

- Acquired 2022
- Base of South Island Operations
- 5 FTE
- Fabrication – Mining Services
- Mining Plant & Equipment Repairs & Rebuilds
- Hydraulic Services
- General Engineering
- Automotive parts, WOF inspection, servicing & repairs

Spring Creek Overview

Location

- West Coast of the South Island, ~10km North of Greymouth, Southern end of Paparoa Range (1265 ha Permit Area)





Spring Creek Overview

Brief History

- Mining first commenced in 1999
- Extraction utilized hydraulic mining (high pressure water monitor)
- Fines pumped from UG to wash plant and oversize conveyed to surface then trucked to CHPP before rail to Lyttelton Port
- Placed into care and maintenance in 2012
- Closed in 2017 when Solid Energy went into liquidation
- Mining permit surrendered in 2018

Historic Production

- ~ 2.5 Million tonnes produced (2003 – 2012)
- Peak annual production 588,000 tonnes
- ~220 staff
- ~$500M spent on project

Terra Firma Proposed Redevelopment

- Continuous miner and roadheaders for mains and panel development
- Continuous miner extraction (pillaring and bottom coaling)
- Target 200-250 ktpa
- Approx. 60-80 direct employees

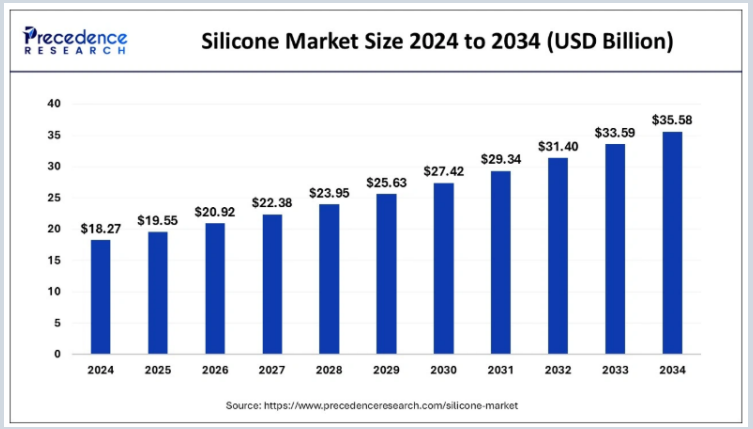


Spring Creek Potential

~2.5Mt Mined

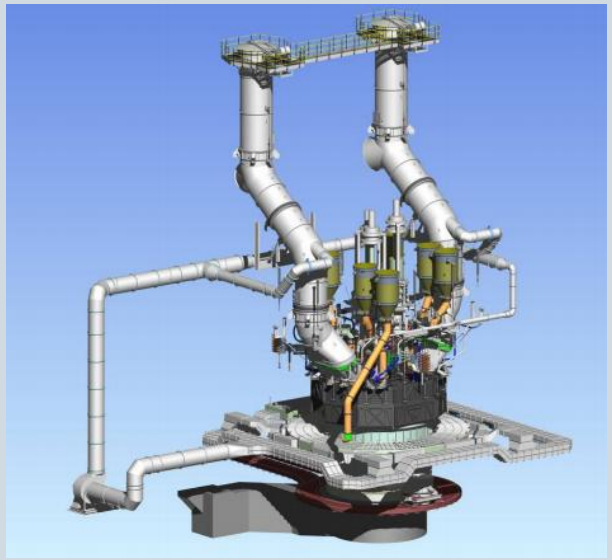
~64Mt Remaining resource

- High Quality Coal – Ideal for specialist markets (Silicon)
- Existing underground access and infrastructure
- Well understood deposit











Modelling Process



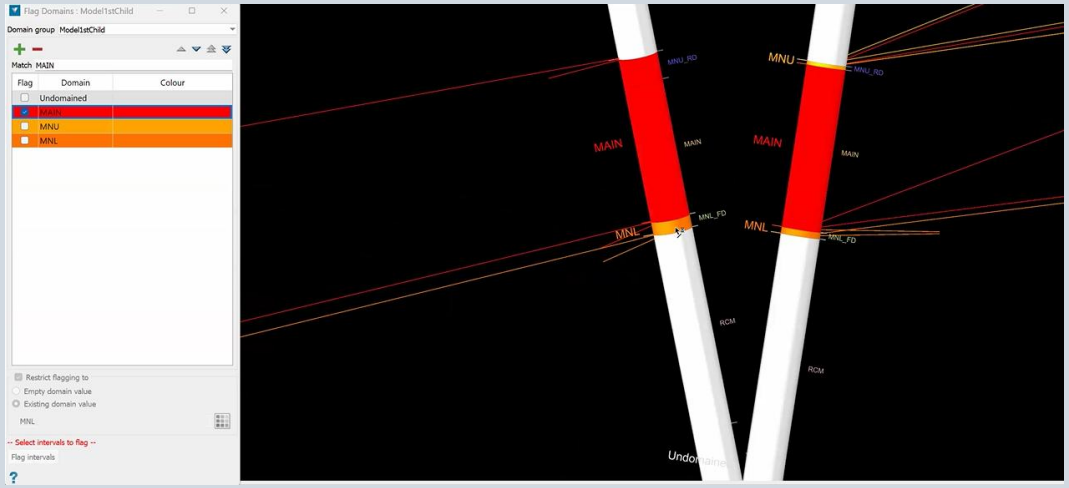
Data Capture

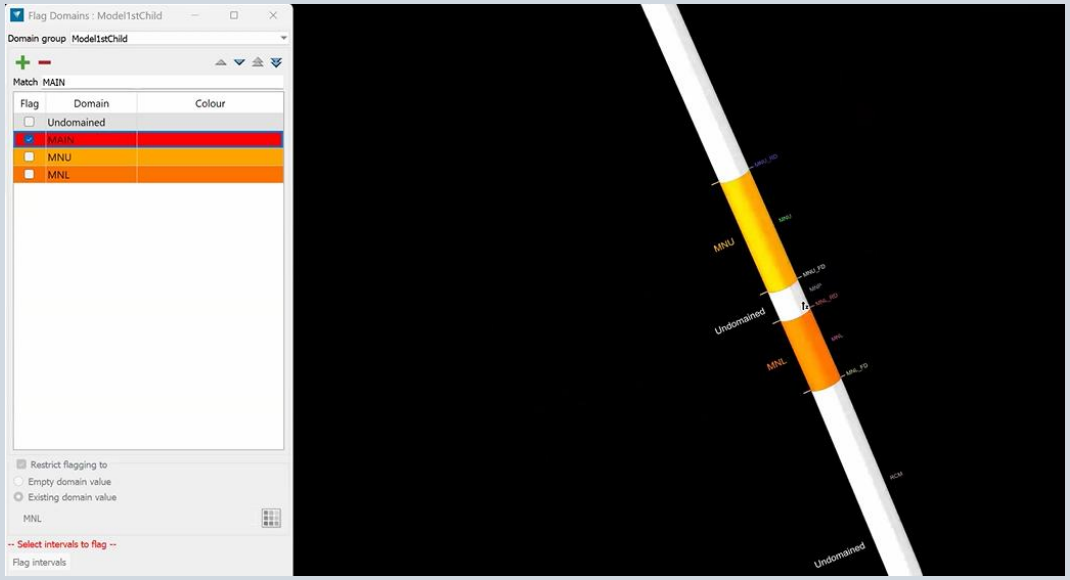
Historical Information Available

- 556 Drillholes
- Drillhole logs
- Downhole Geophysics 60% of holes
- Coal Quality laboratory testing
- Underground Geological Observations (Roof/Floor Points & Fault Pickups)
- iReg – Hand drawn Cross Sections
- Historical Geological Models / Interpretations
- Existing Mine Plans + Hydro Design
- Existing Feasibility Study (PAG5)
- Former SENZ Personnel

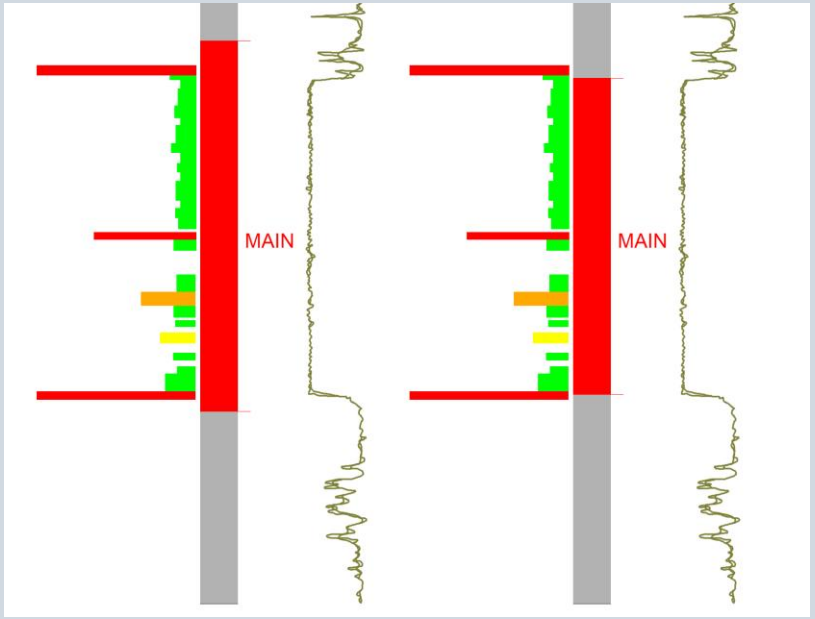


Domaining

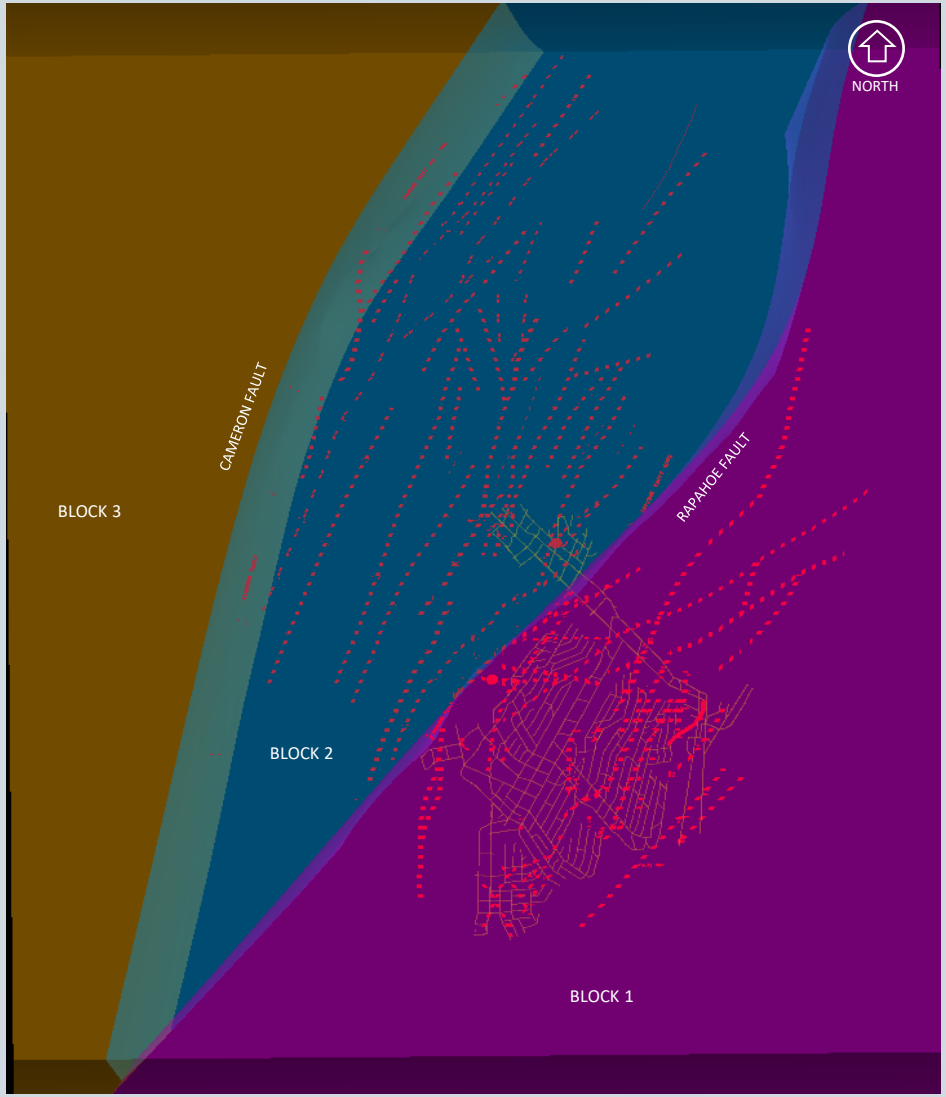




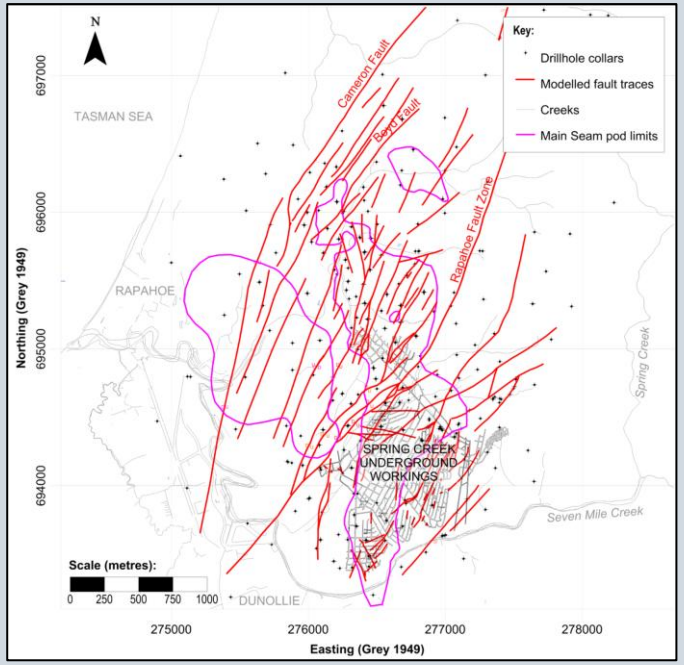
- Setting up data to be consistent to feed into block model
- Seam floor and roof dilution removed
- Align to geophysics
- Applied to the entire 556 drillholes



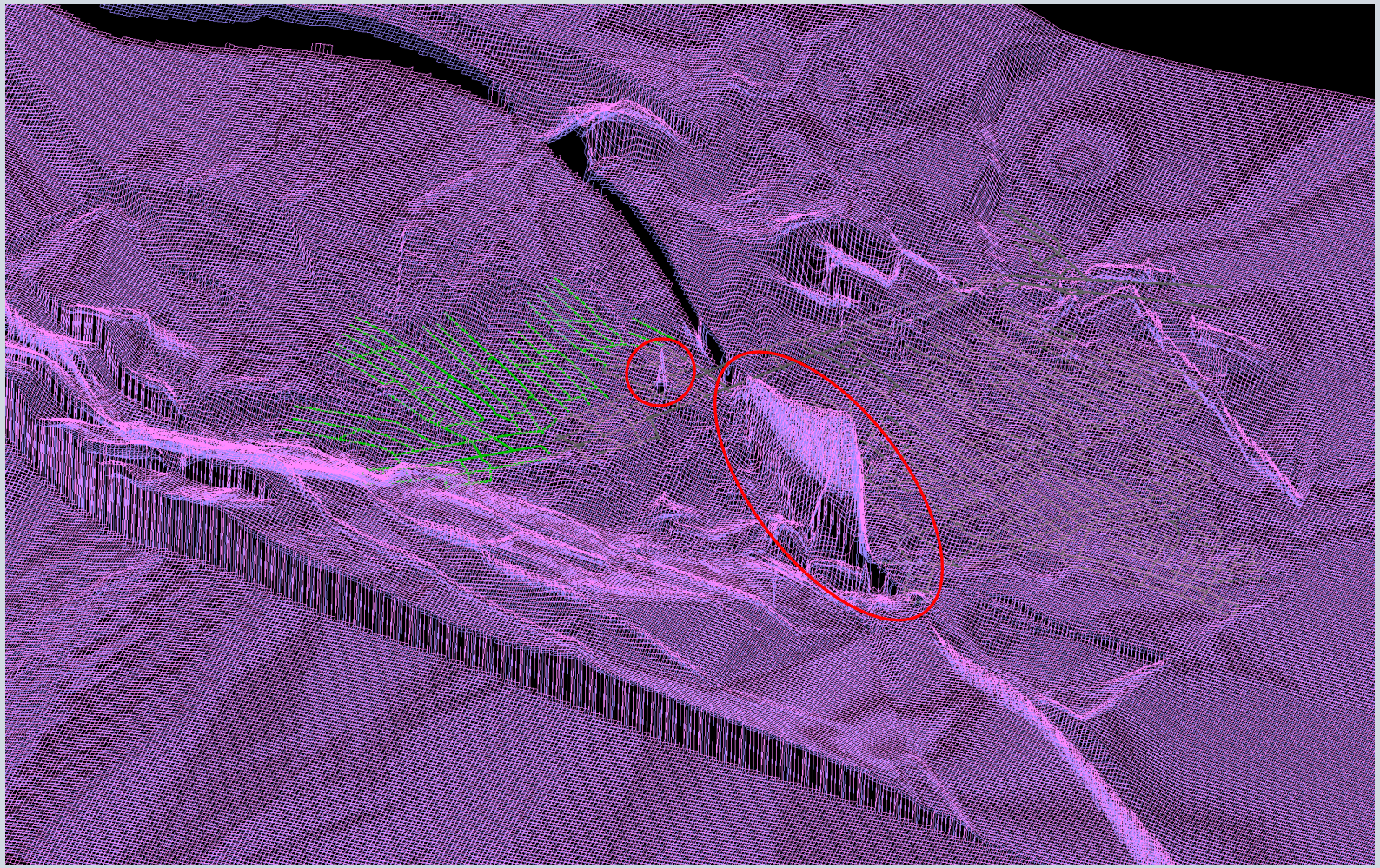
Structural Model



- Structures based off SENZ interpretation
- Developed Fault Blocks bounded by two significant faults >60m offsets
- Used validated intercepts and underground measurements to position Rapahoe Fault
- Small 5 – 20m fault offsets modelled using existing W-Tag (forces vertical offset in model)



Refining the Model

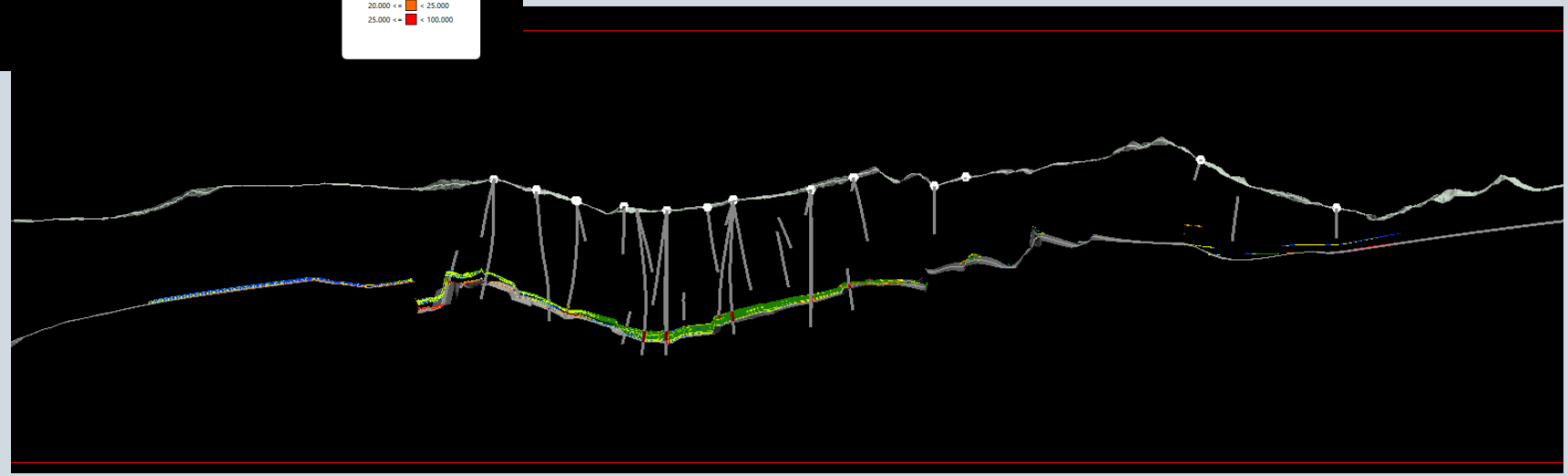


- Hybrid Model – Grid Stacking + inclusion of additional design data
- Legacy interpretation points reviewed
- Geologic interpretation

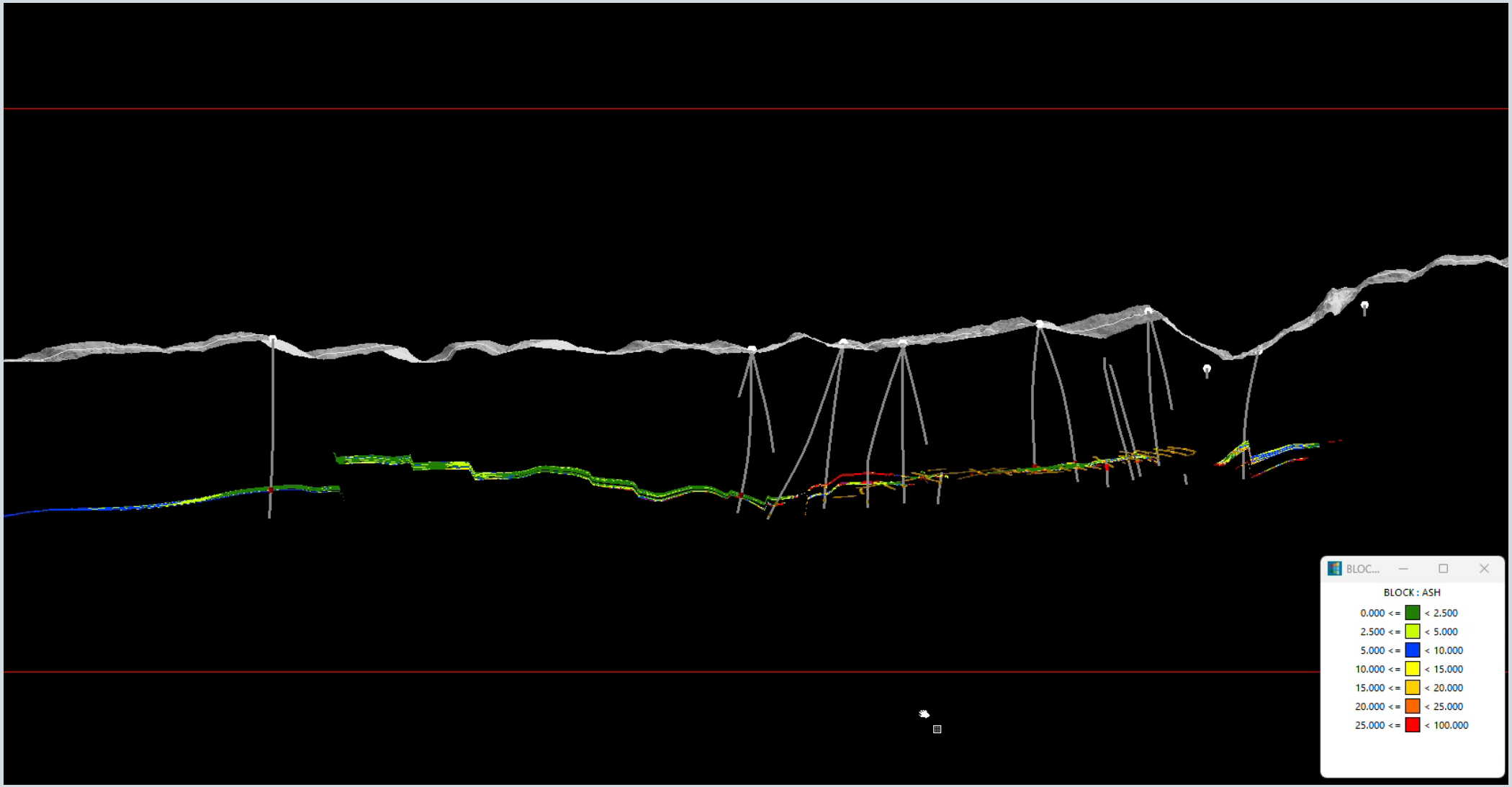
HARP Block Model – Associated Coal Quality



- Inverse distance modelling algorithm
- Unfolding Projection Method – Ensures CQ estimates blocks in the same relative position
- 5.0m(x) x 5.0m(y) x 0.5m(z) blocks
- Dark Green < 2.5 ASH ad

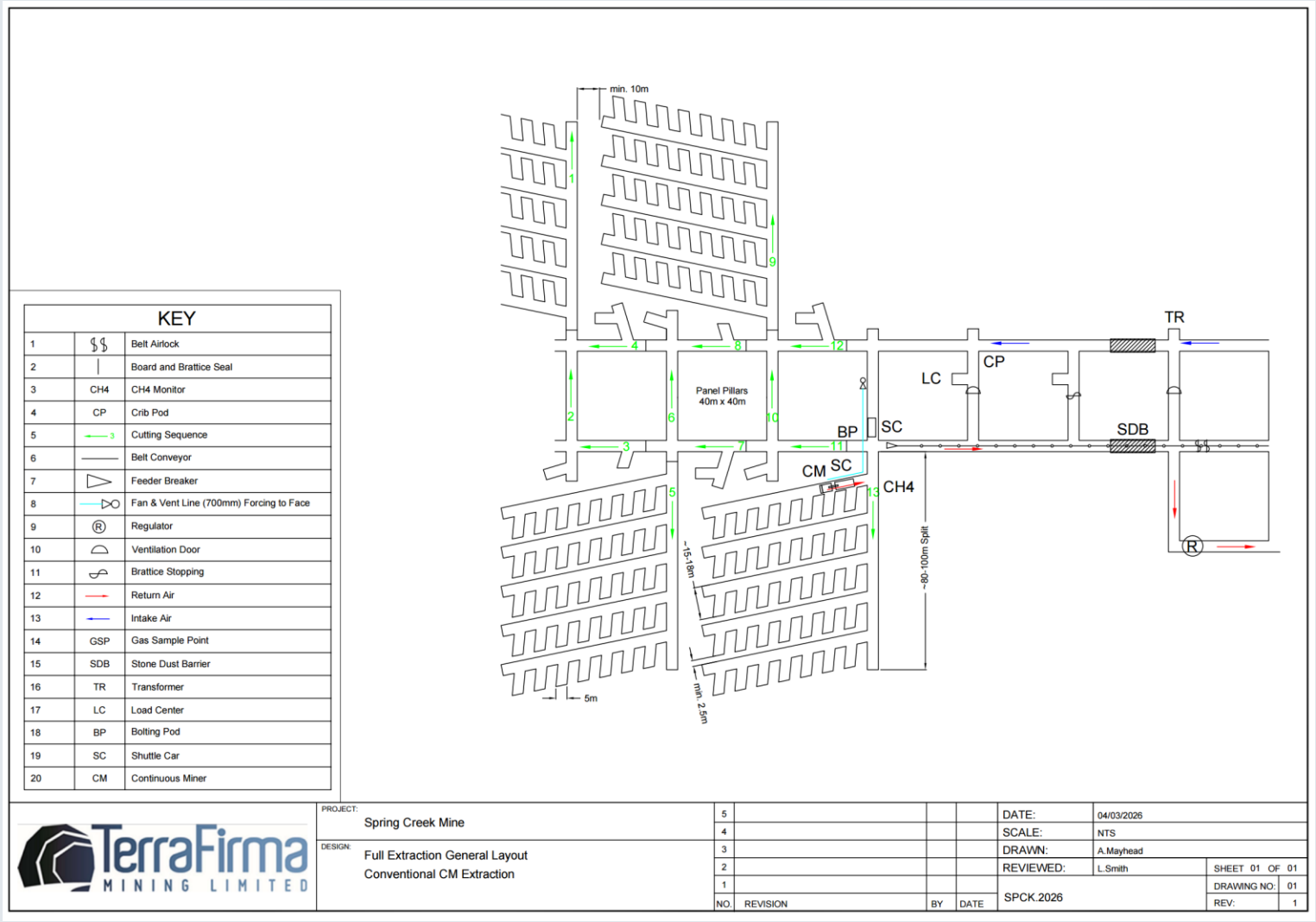


HARP Block Model – Associated Coal Quality



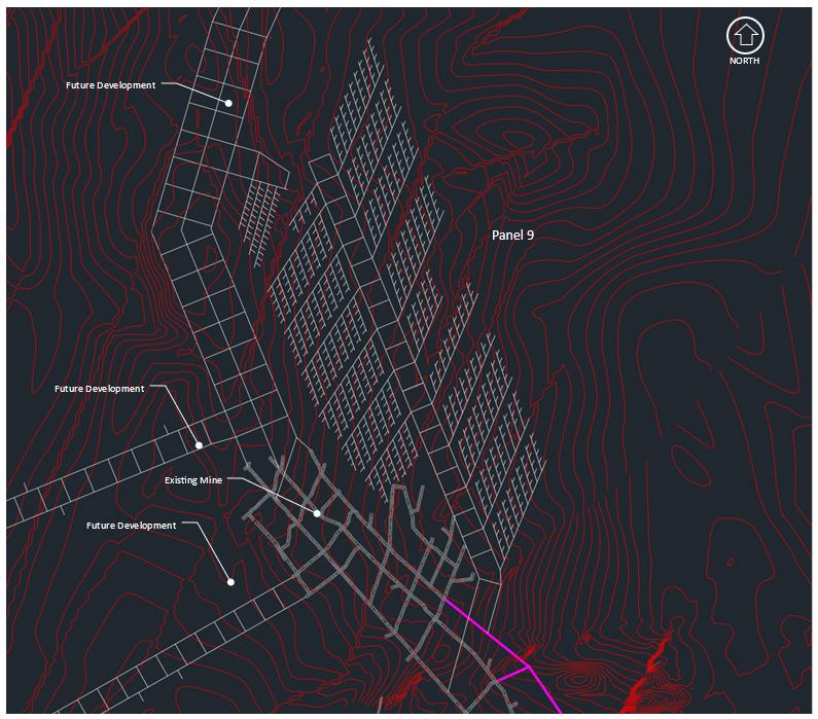
Set Design Parameters

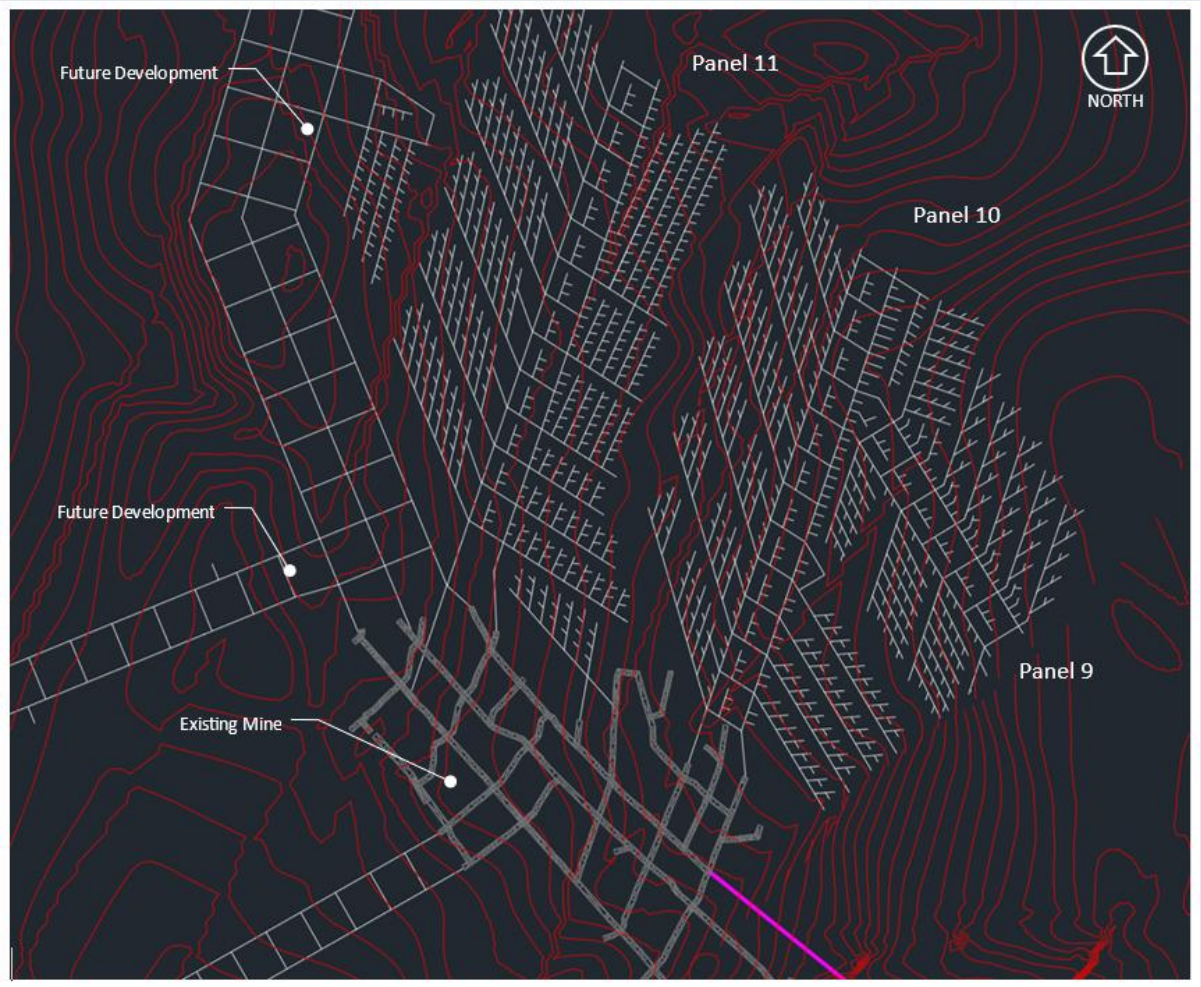
- 1:5 maximum gradient
- Avoid major fault zones in development where practicable
- Single headings limited to 200m
- 50m barrier pillar from historical workings and Mains
- Target low ash coal identified in the block model
- Position roadway high in seam to allow for bottom coaling



Design Layout

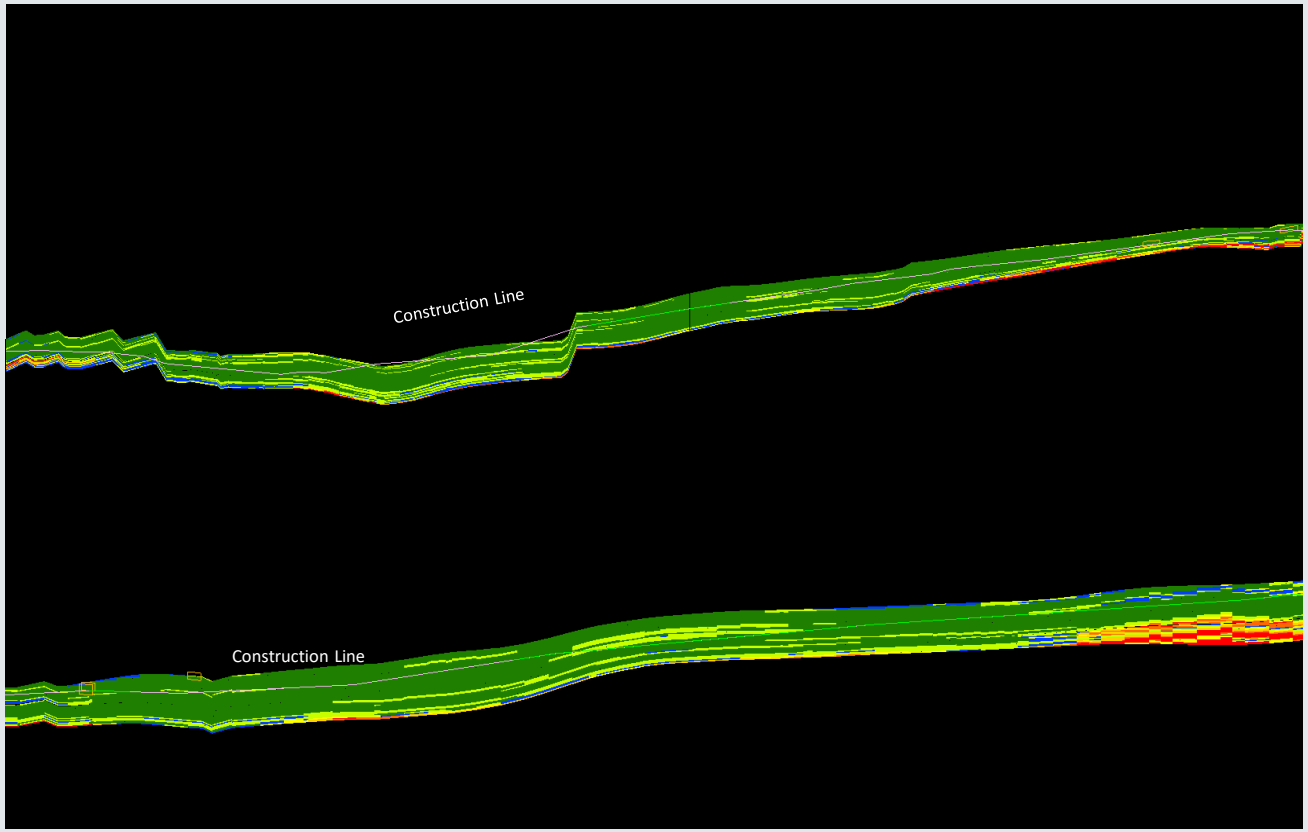
- Rough out design centerlines using 10m contours
- Steeply dipping and faulted seam caused a headache
- Endless iterations – Decided on multi panel design that targets the high-quality coal and allows operational flexibility with panel sequencing

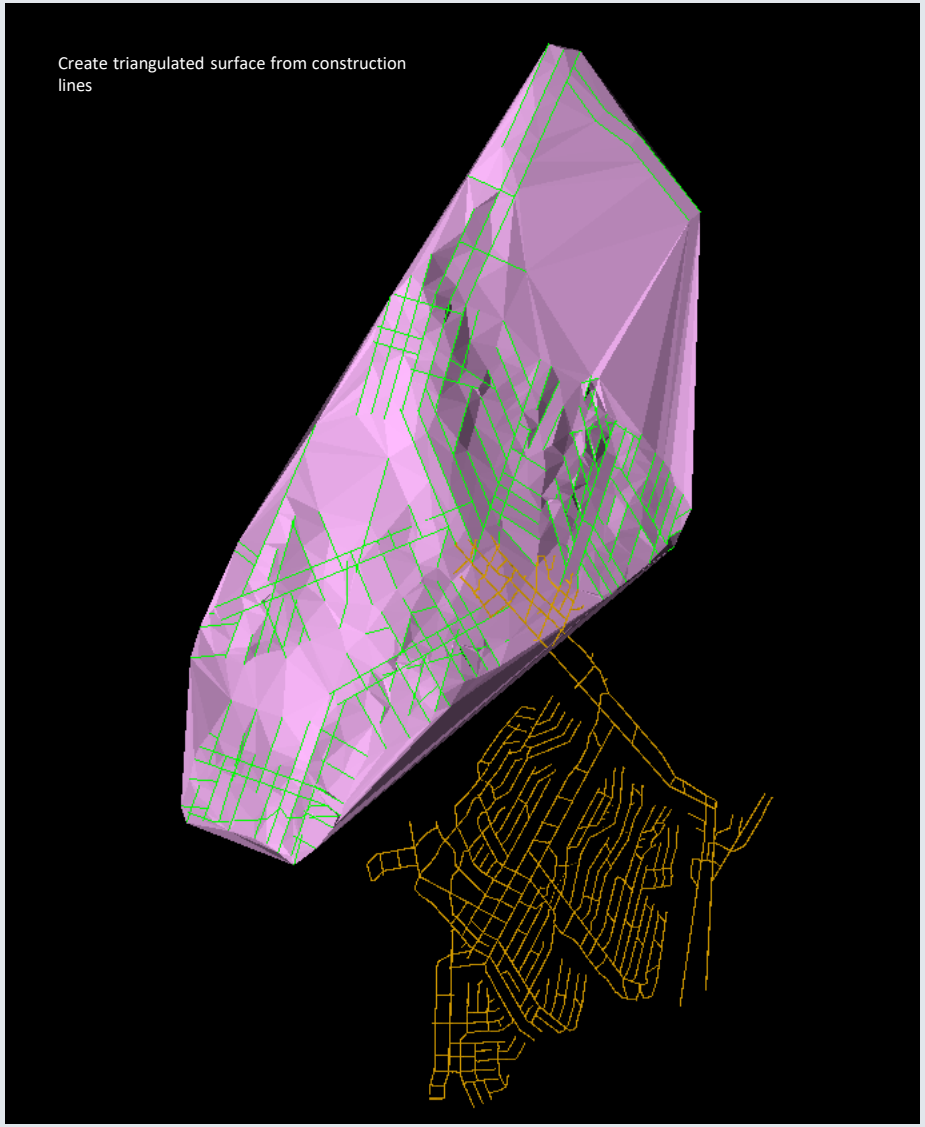




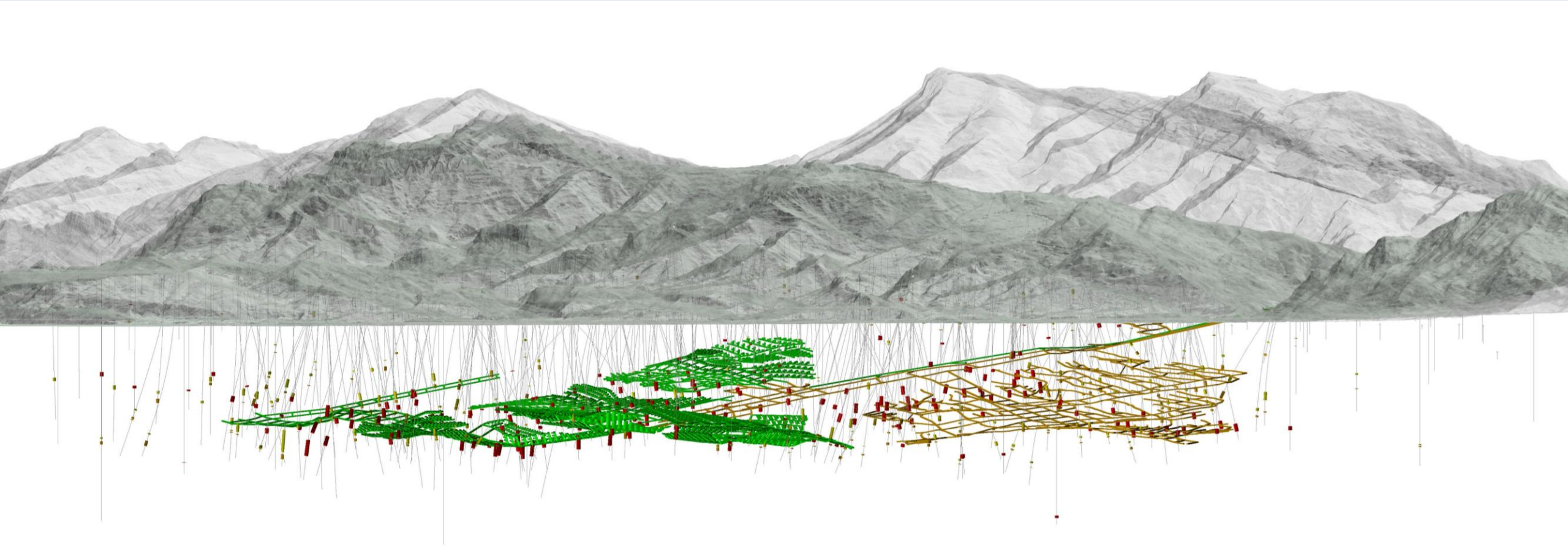
Targeting High Quality Coal

- Construction lines restricted to 1:5 targeting low ash and low Sulphur





Mine Design

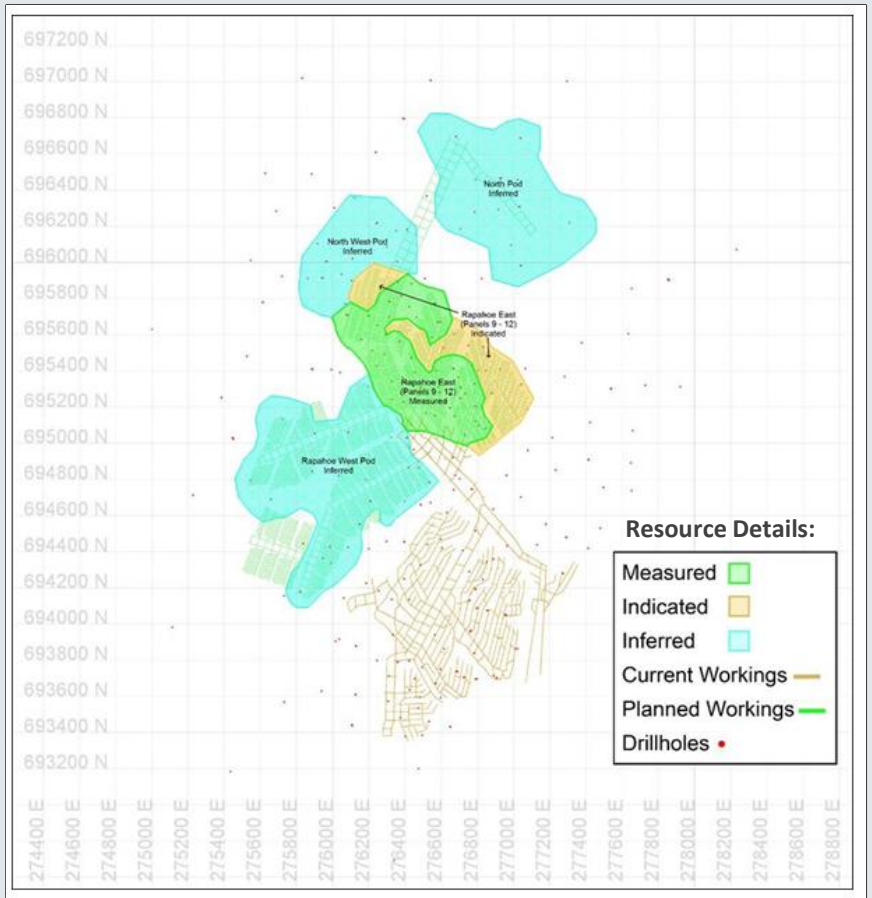


Detailing historical (orange) and planned (green) workings, drill holes and surface topography

Resource

9 Mt Measured

3 Mt Indicated

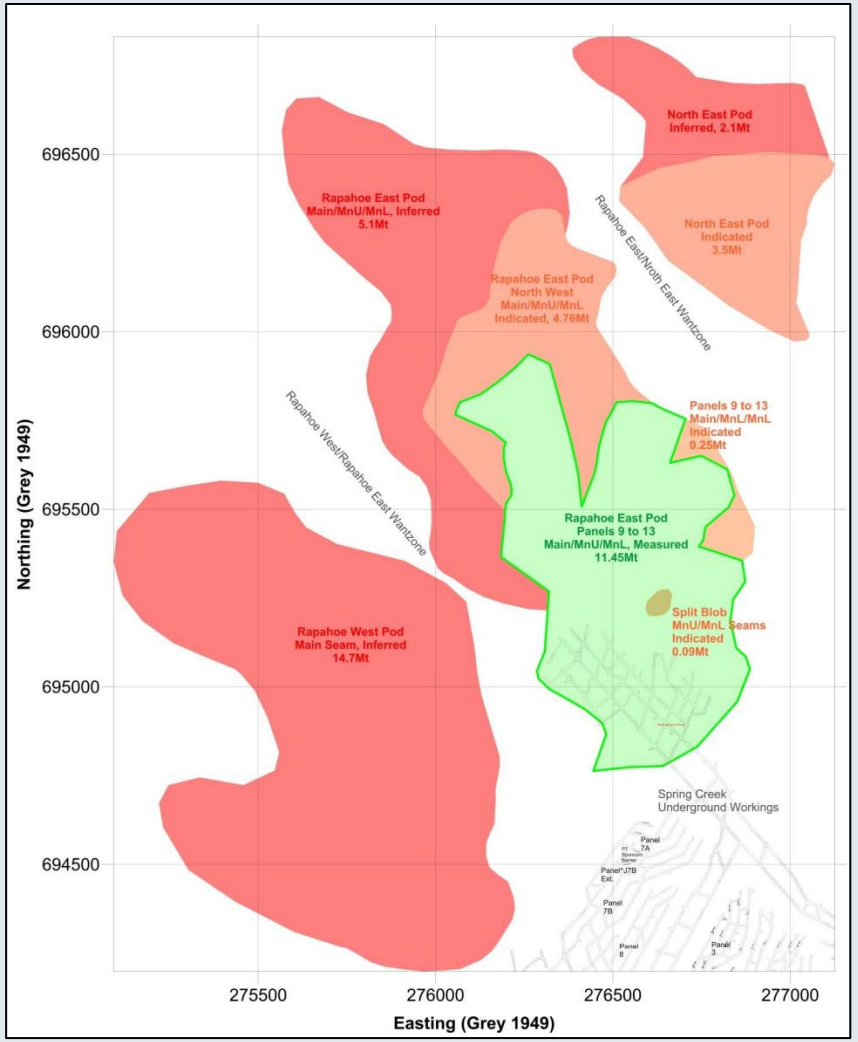


Resource Area	Seam	Resource Classification	Tonnes (Mt)	Geological Loss (%)	In-Ground Tonnes (Mt)
Rapahoe East (Panels 9 - 12)	Main, MNU, MNL	Measured	9.25	5%	8.78
	Main, MNU, MNL	Indicated	3.37	10%	3.03
Rapahoe West	MNU,MNL	Inferred	13.52	20%	10.82
North West Pod	Main, MNU, MNL	Inferred	4.65	20%	3.72
North Pod	Main, MNU, MNL	Inferred	8.58	20%	6.87
Strongman Block	Lower/Morgan	Inferred	26.76	20%	21.41
North Block-E. Margin	D Seam	Inferred	12.00	20%	9.60
				Total Resources	64.2Mt

Notes:
- Resource model has the following cutoffs applied to the blockmodel
- Seam thickness greater than 2.0m
- Less than 800m below surface
- Ash cutoff 12% and sulphur cutoff 0.75%

Resource model and boreholes

SENZ Model



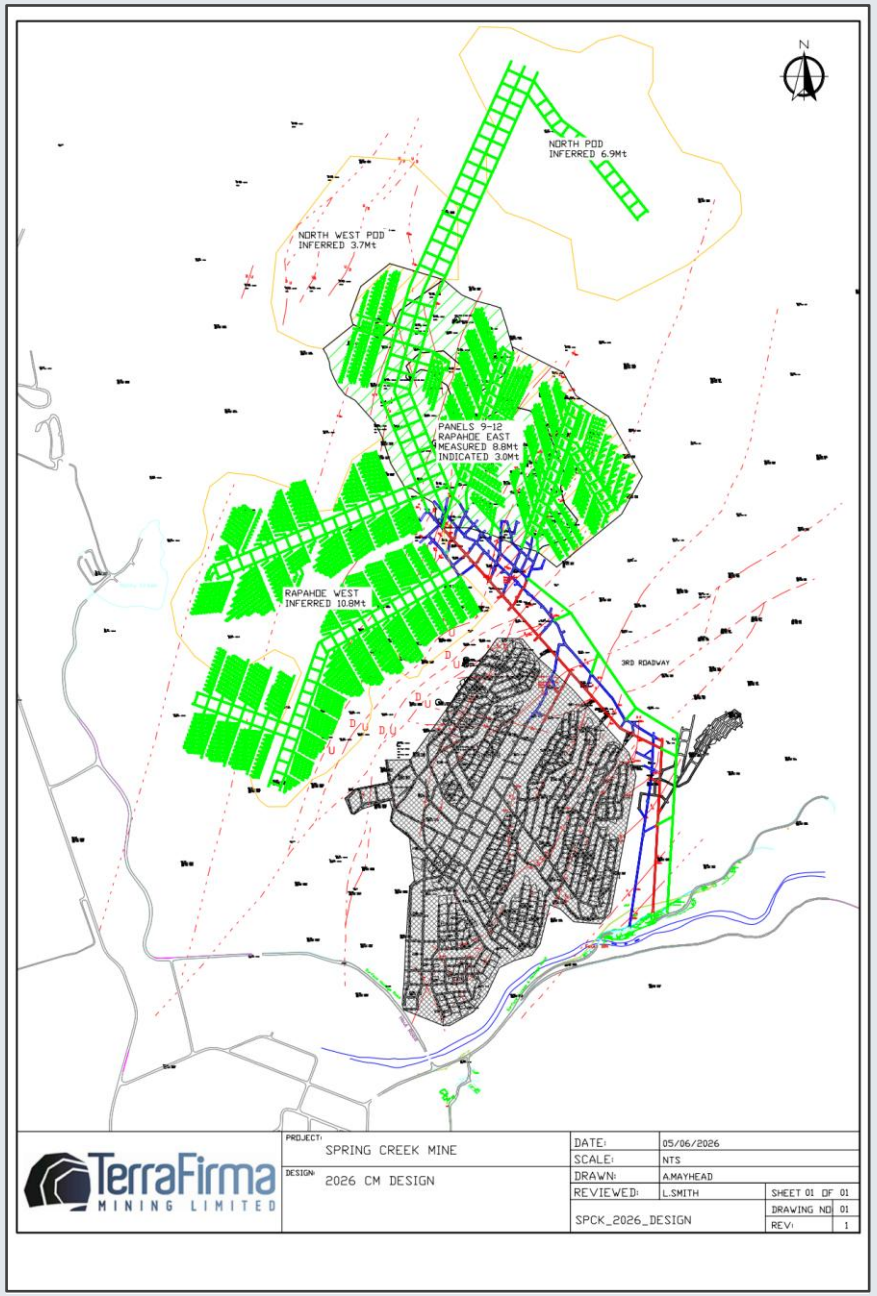
Reserves

0.9 Mt Proved

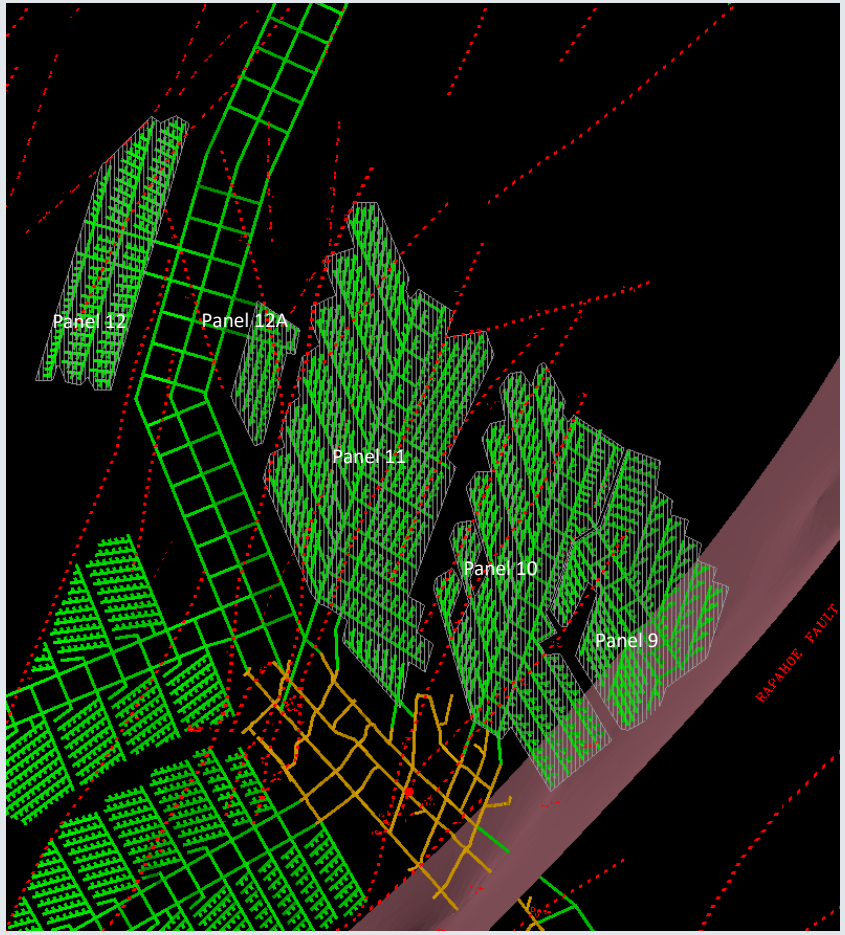
0.5 Mt Probable

Reserve Status	Panel 9 (t)	Panel 10 (t)	Panel 11 (t)	Panel 12 (t)	Panel 12A (t)	Mains (t)	Total (t)	%
Proved	1,845	181,847	316,980	77,184	22,711	295,131	895,698	64%
Probable	119,195	104,960	147,857	75,746	19,103	31,165	498,026	36%
Total	**121,040**	**286,807**	**464,837**	**152,930**	**41,814**	**326,296**	**1,393,724**	**100%**

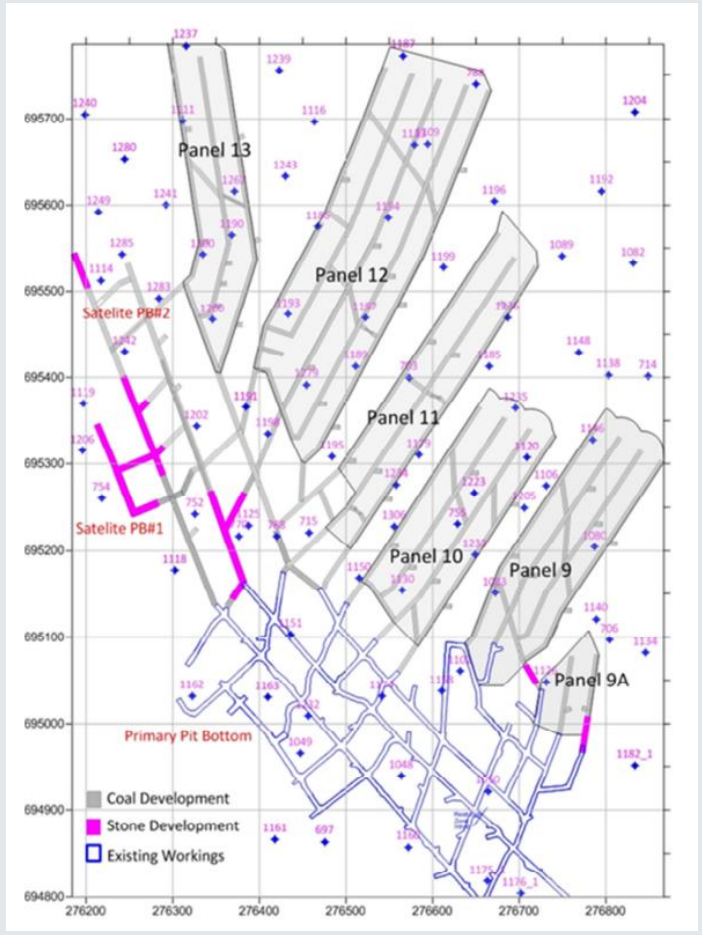
Reserve Status	ROM (Mt)	Ash AD (%)	Total Sulphur (%)	Volatile Matter (%)	Moisture (%)
Proved	0.9	2.09	0.46	41.8	5.8
Probable	0.5	2.62	0.41	41.5	6.0
Total	**1.4**	**2.28**	**0.45**	**41.7**	**5.9**



Mining Method Comparison



1.4 Mt Conventional Mine - TFM



1.9 Mt Hydro Mine - SENZ


TerraFirma
www.terrafirma.kiwi.nz