

# Diversion of the Mangakotukutuku Stream through an Open-Pit Mine:

## Construction Update

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New Zealand

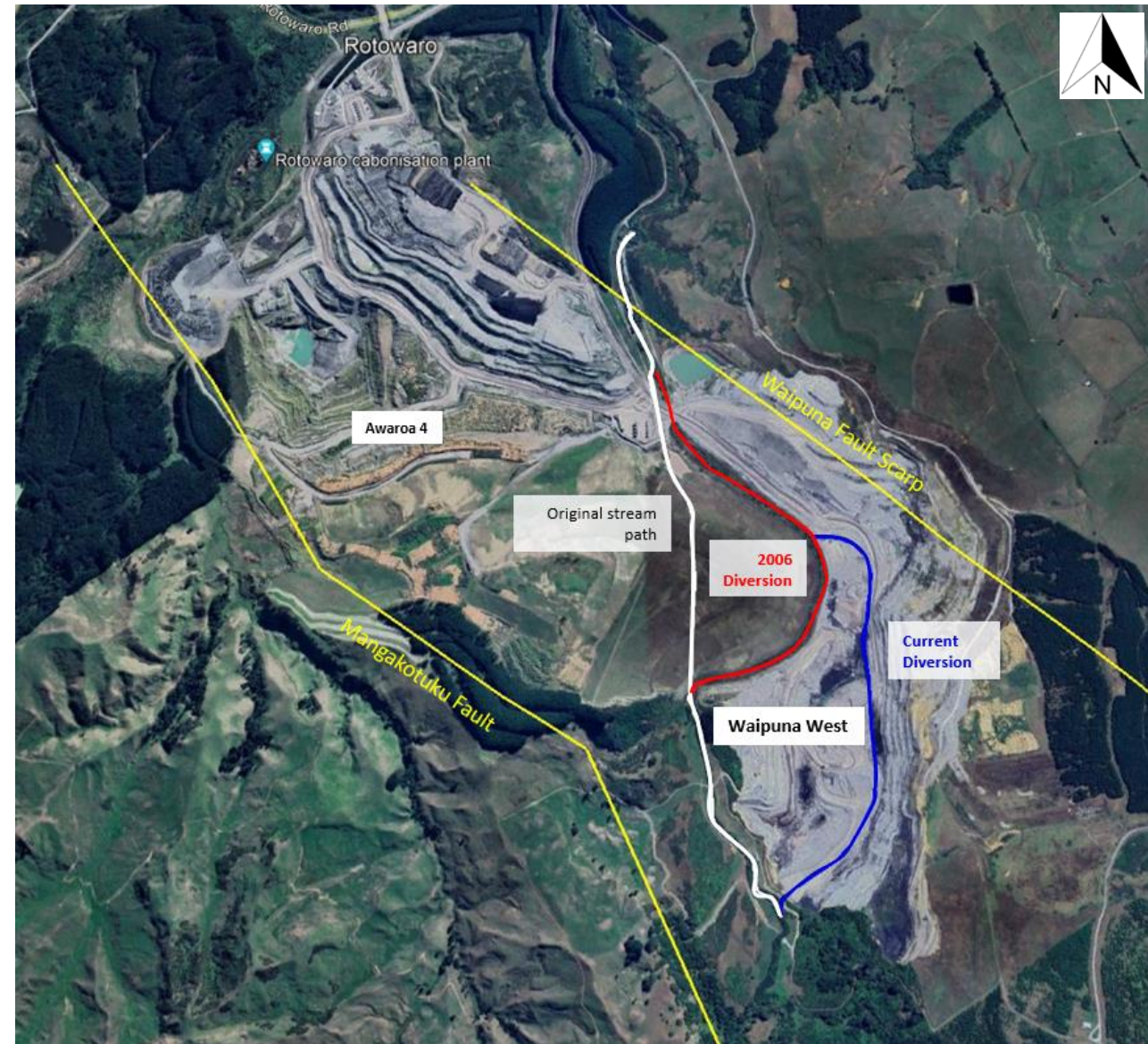
AusIMM New Zealand Branch Annual Conference - Enabling a Sustainable Future

20 - 22 August 2023  
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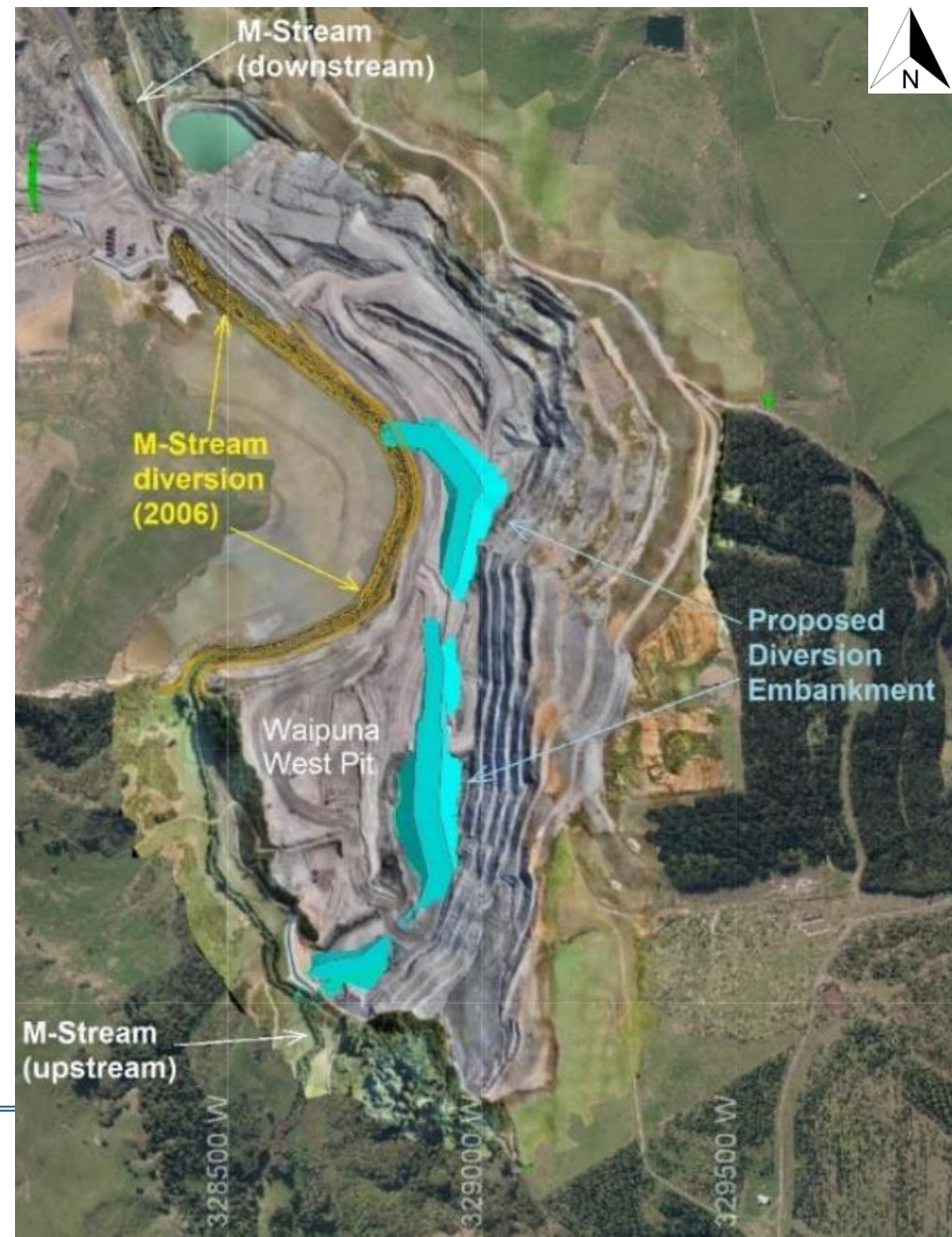
# Rotowaro Opencast Mine

- Located 10 km west of Huntly, Waikato, NZ
- Subbituminous thermal coal for domestic market
- Currently mining from the Waipuna West Pit





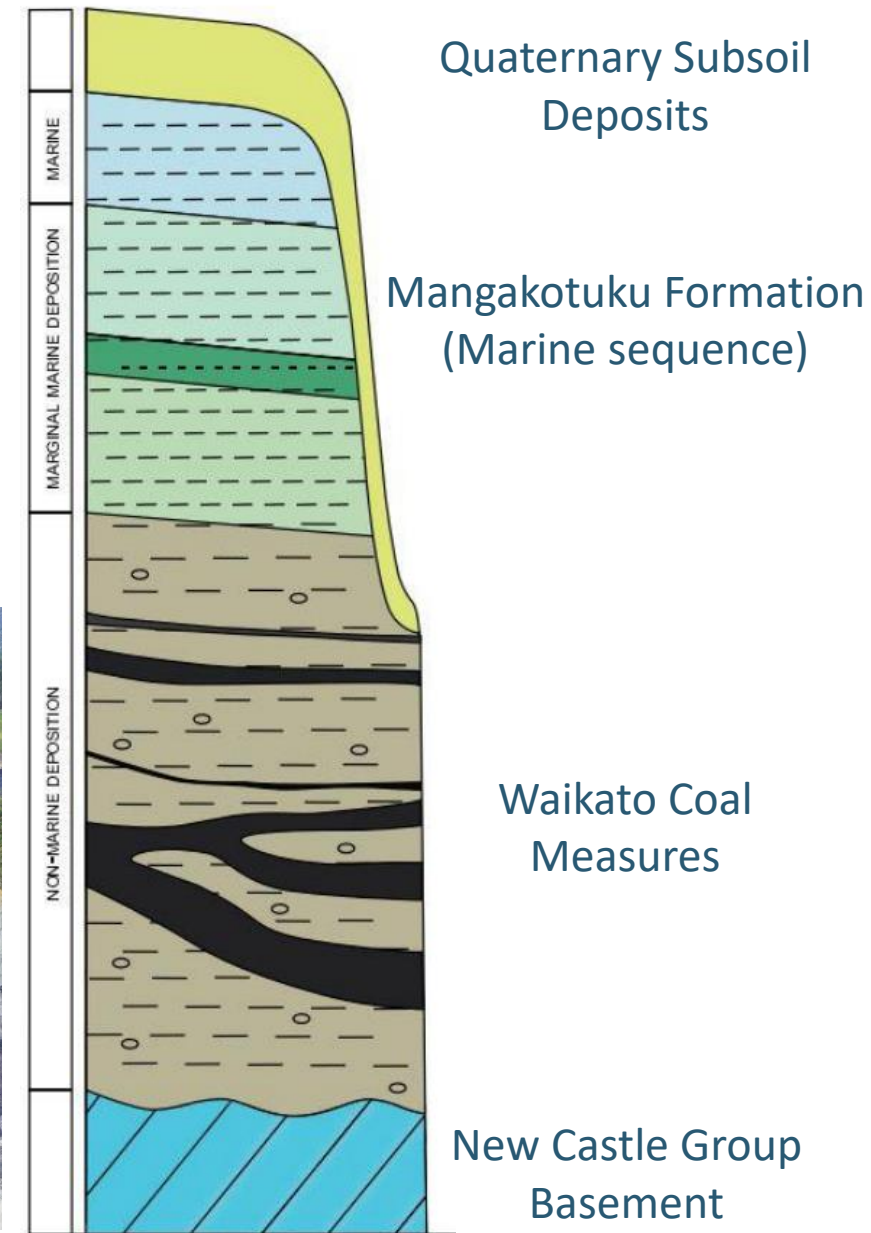
# Layout of the Stream Diversions





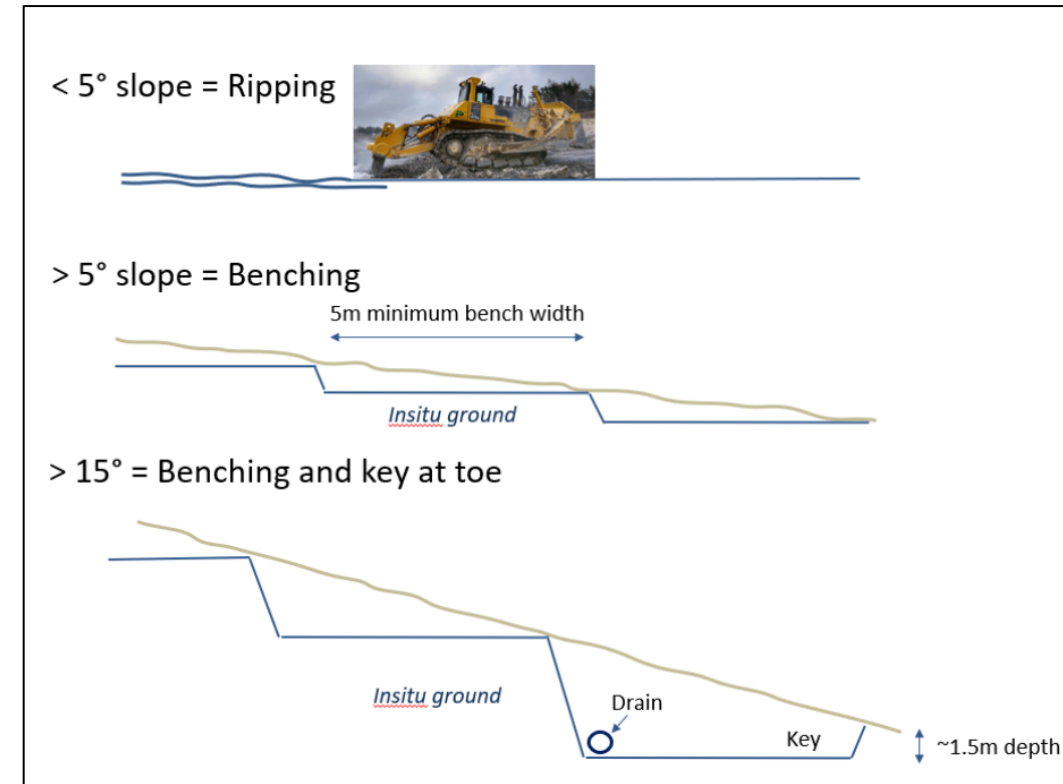
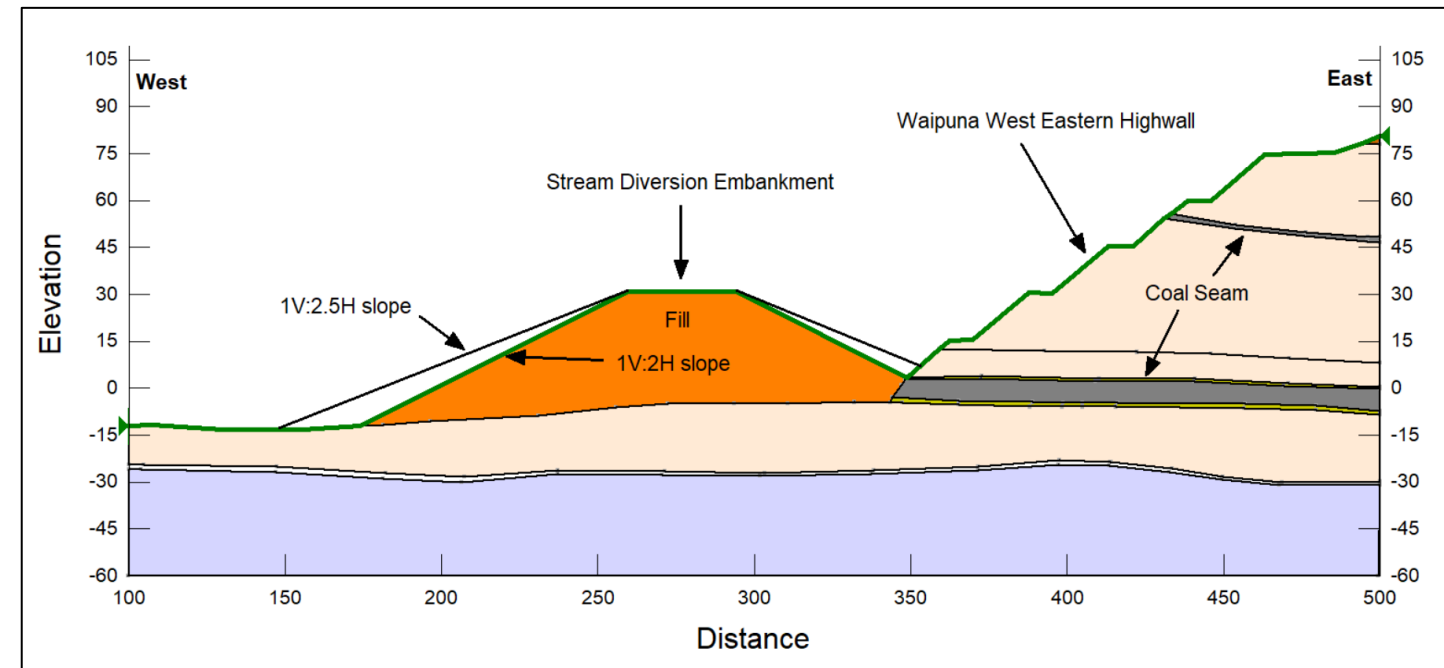
# Geology of the Rotowaro Opencast Mine

- Waikato Coal Measures (WCM) comprises:
  - Carbonaceous mudstone
  - Sandy mudstones and muddy sandstones
  - Rare conglomerates } “Fireclay”
- Mining the Renown, Kupakupa and Taupiri coal seams



# Design

- The diversion is mainly built as a free-standing fill embankment
- Embankment foundation is based in the lower WCM
- Bedding within the Waipuna West pit is mostly sub-horizontal to shallow dipping





# Design Philosophy

- In-stream features
  - Hydrology
  - Habitats for indigenous fish
    - Long- and short-finned eel, Inanga, Banded Kōkopu, and more

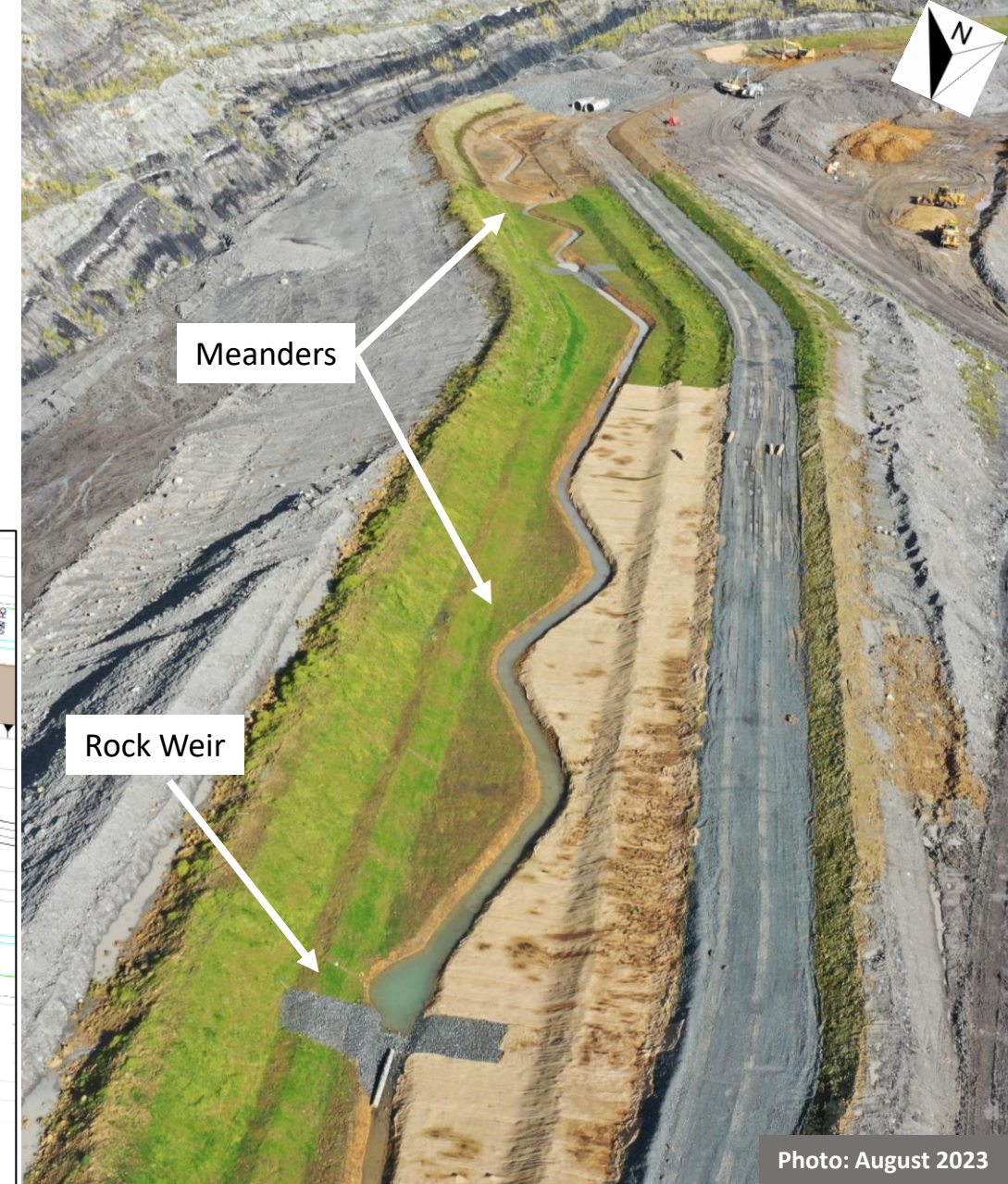
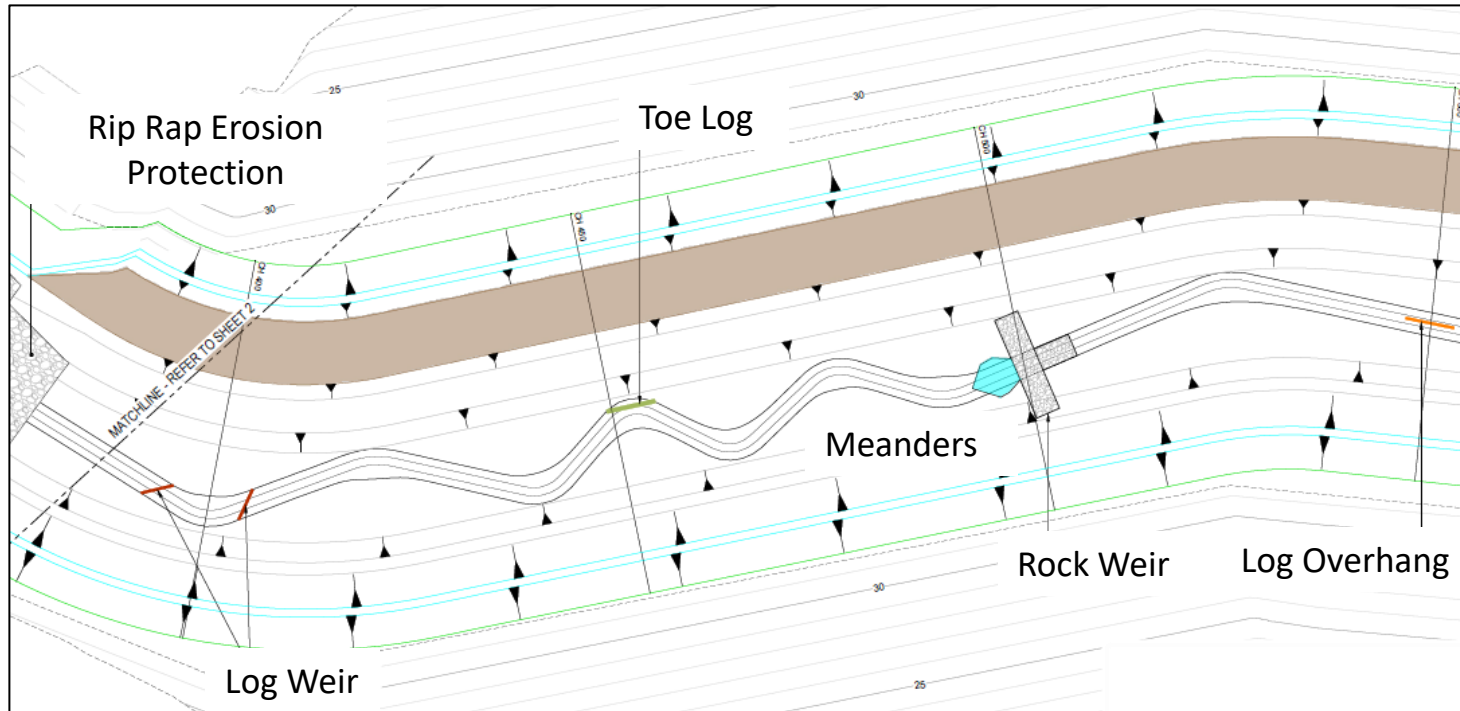


Photo: August 2023



# Ecological Management Plan

- Coconut matting & hydroseeding grass
  - Browntop, Barley, Slender poa, White clover, Strawberry clover, Creeping red fescue



Photo: July 2023



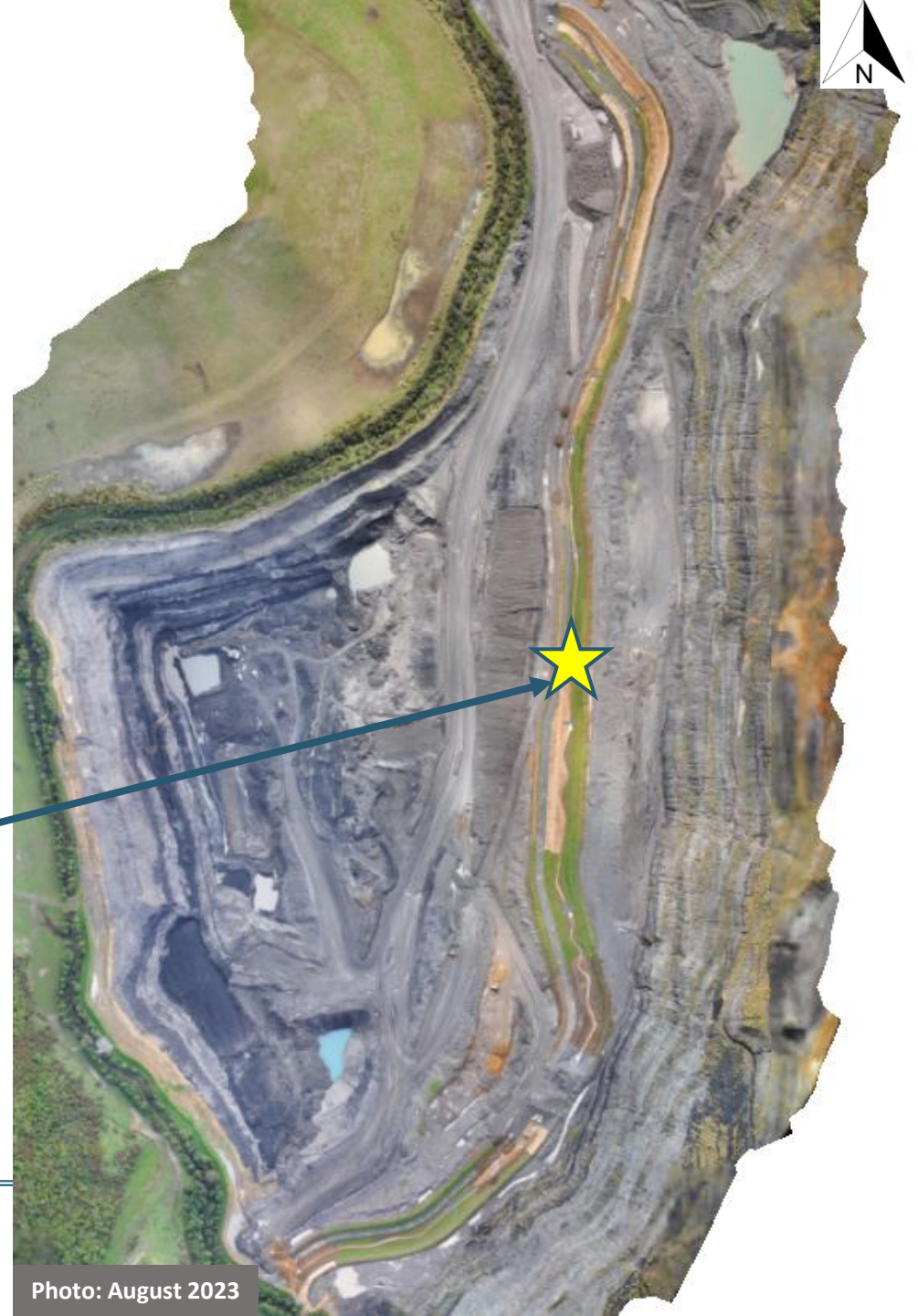
Photo: June 2023



# Remaining Work

## – Centre of Embankment

- Low flow channel
  - Install in-stream features – rock weir, toe logs, etc.
  - Place clay liner
- Stopbanks
  - Spread topsoil
  - Install coconut matting
  - Hydroseeding
- Install monitoring pins and take baseline reading
  - Every 75 m
- Install piezometer
  - At deepest area of fill

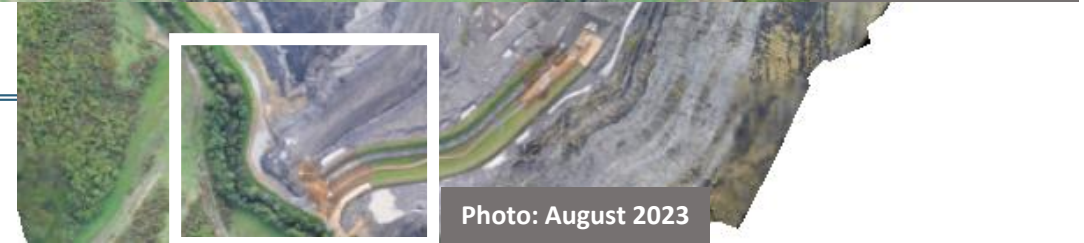
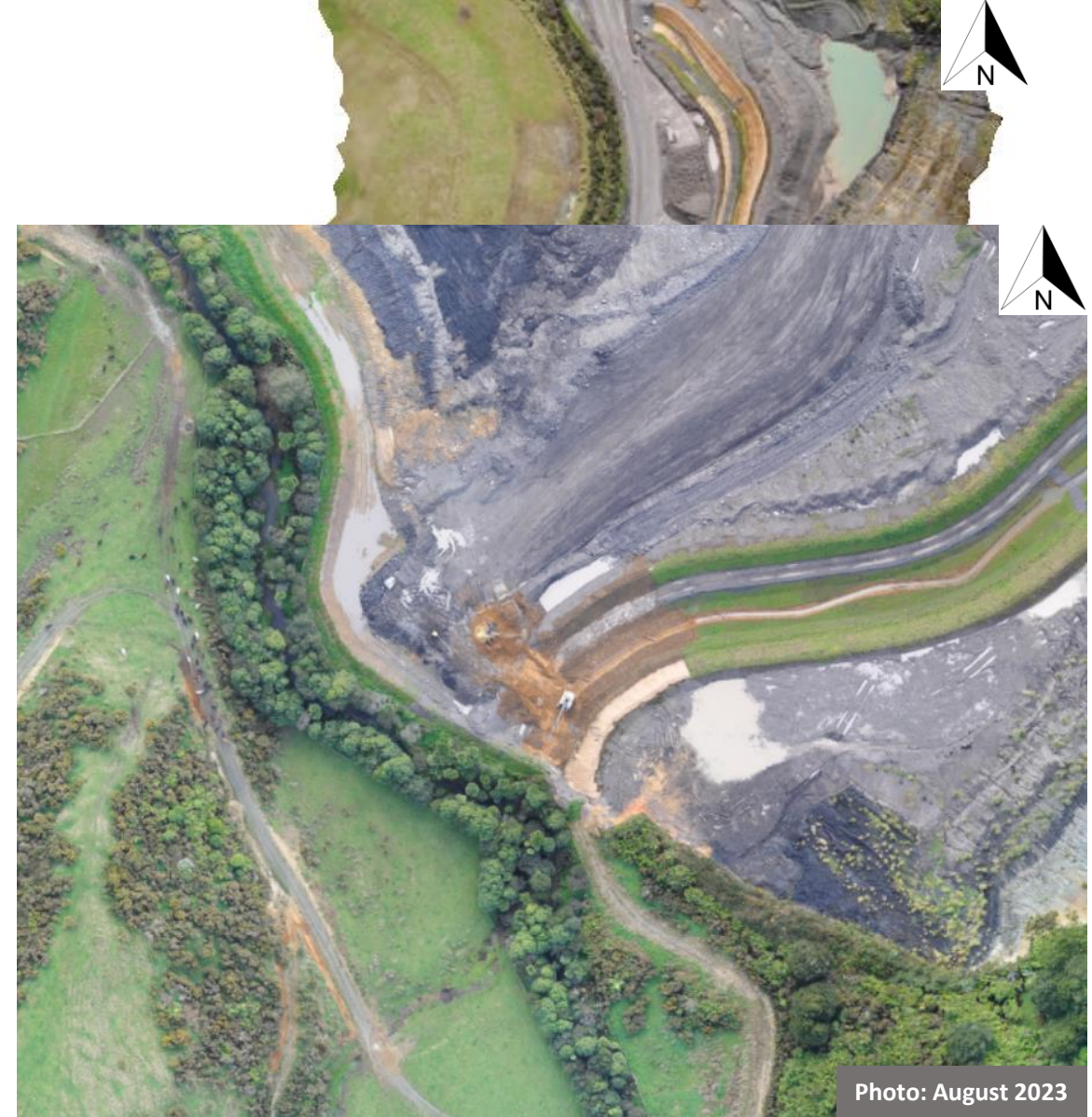




# Remaining Work

## – Up Stream Tie-in

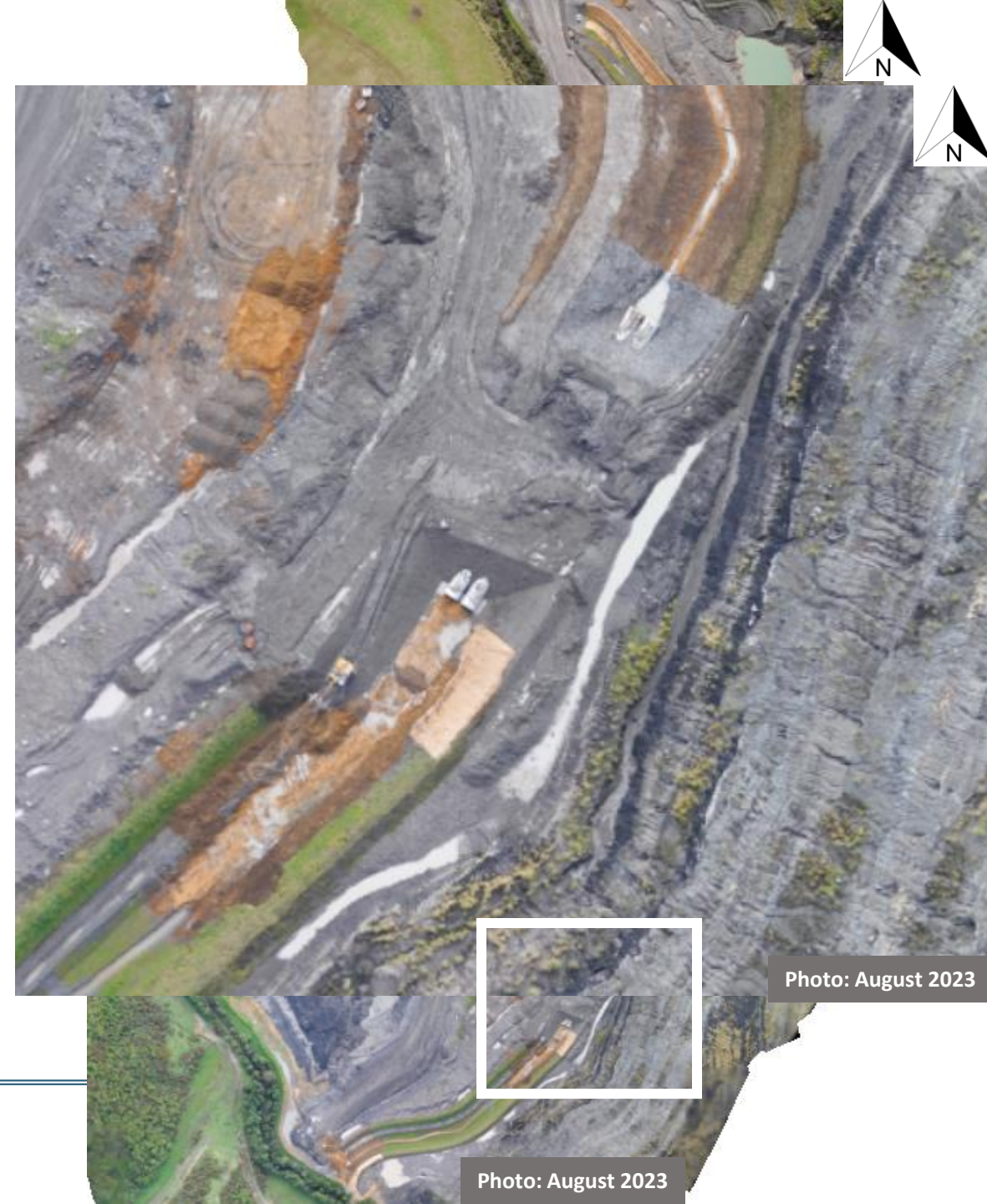
- Construct remaining stopbanks
  - Hydroseeding
  - Coconut Matting
- Excavate low flow channel





# Remaining Work – Culvert B

- RipRap – GAP200/400
- Spread topsoil
- Install coconut matting
- Hydroseeding

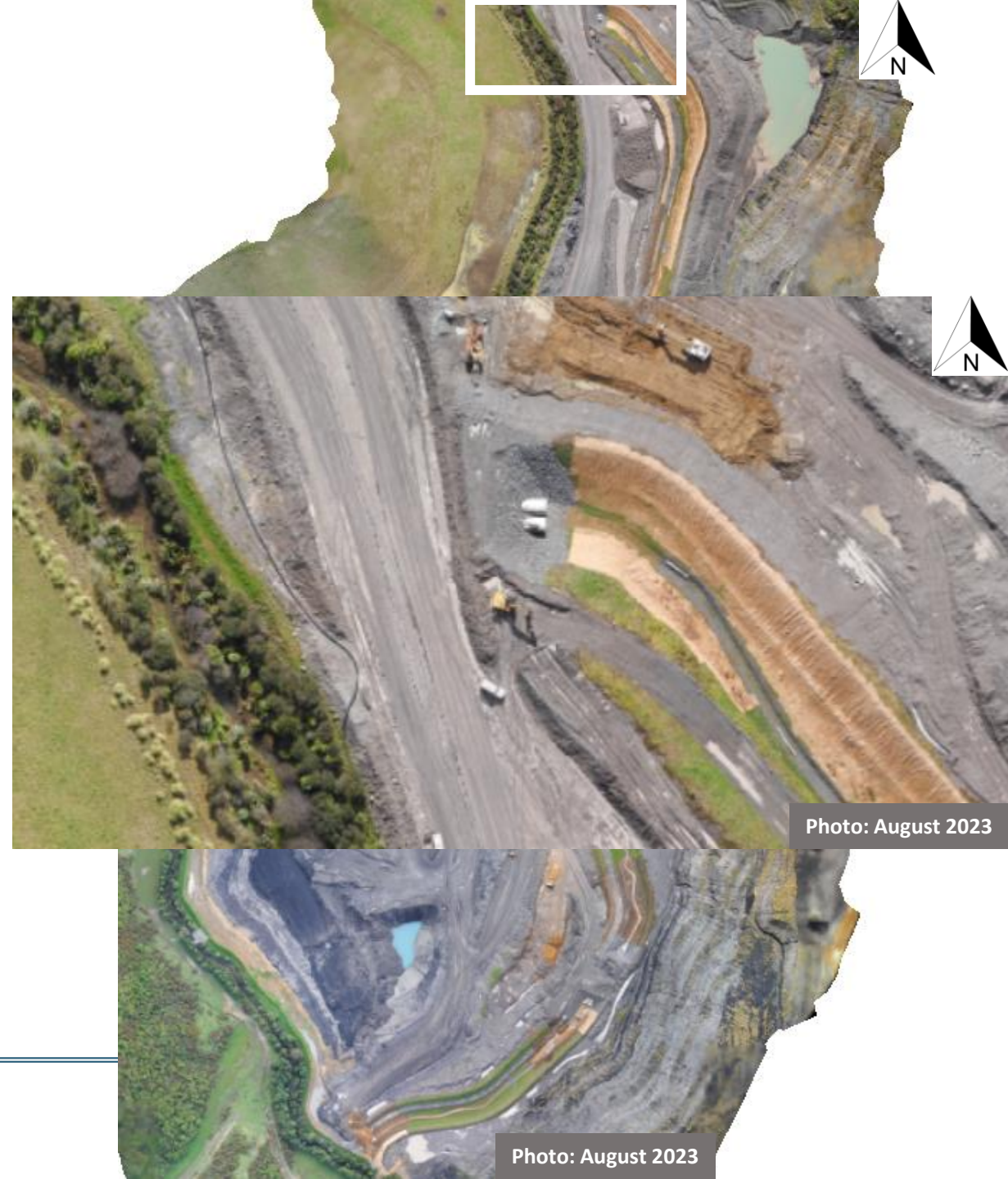




# Remaining Work

## – Down Stream Tie in at Culvert A outlet

- Excavate low flow channel
- Place RipRap
- Hydroseeding
- Install coconut matting





# Other Remaining Work

## Pre-Diversion

- 1.4 km of riparian enhancement planting
  - Kiokio, Karamū, Rewarewa, Kānuka
- Trap indigenous fish to catch & relocate

## At Time of Diversion

- Opening the channel
- Block off existing stream channel
- Iwi blessing

## Post-Diversion

- Electrofishing
  - Stuns fish to catch & relocate



Photo: 2006 Diversion, current steam path. June 2023



# Summary

- Geotechnically & environmentally sustainable stream diversion
- Constructing from on site materials
- Plan to divert September 2023





**THANK YOU**

