

# Waimea Community Dam Update

17 December 2019

Waimea Water

# Agenda

- **Design**
- **Construction**
- **Environmental**
- **Cost and schedule**

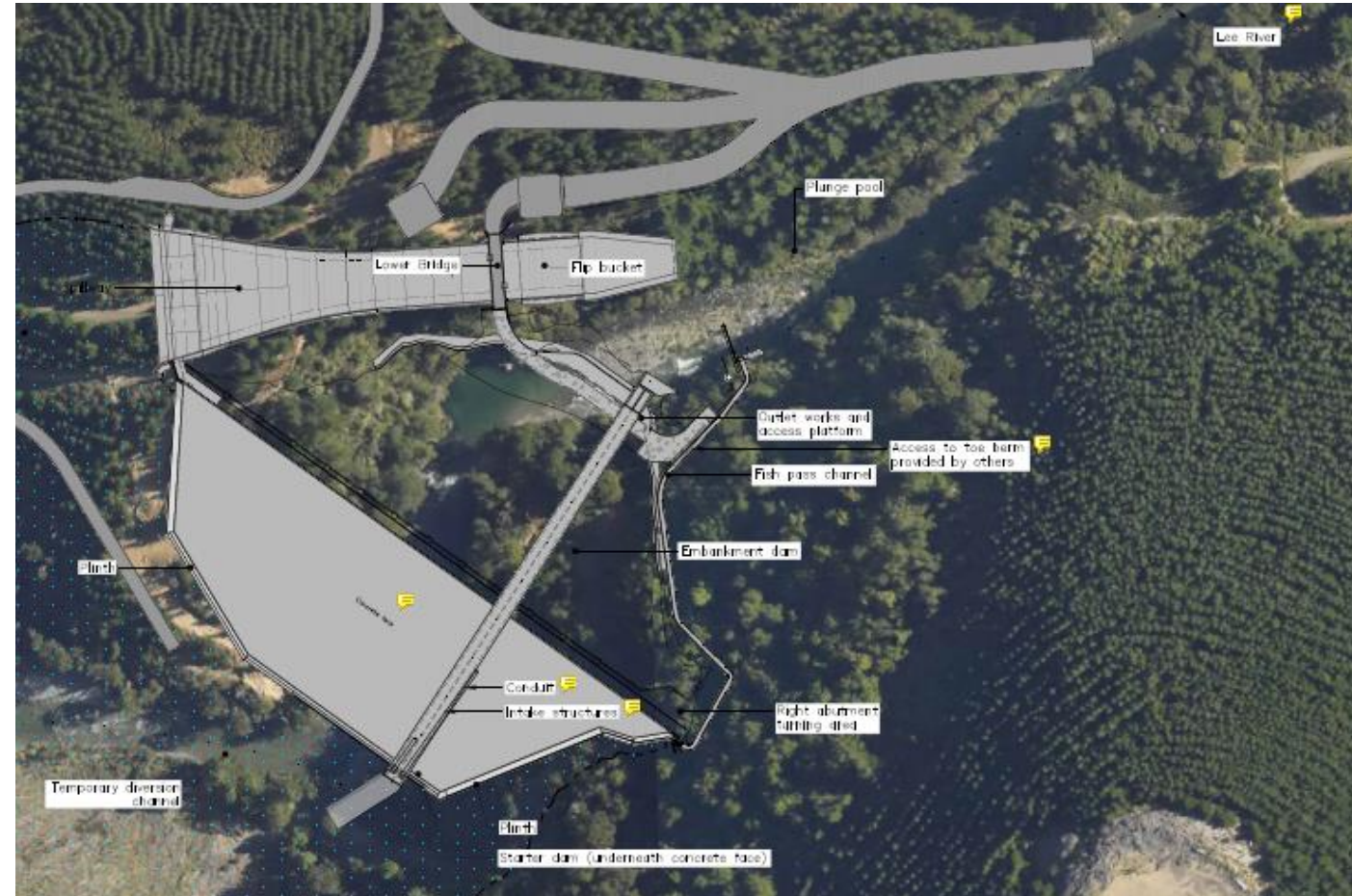
# Waimea Dam is underway and progressing well

Ground Breaking Ceremony 9 August 2019



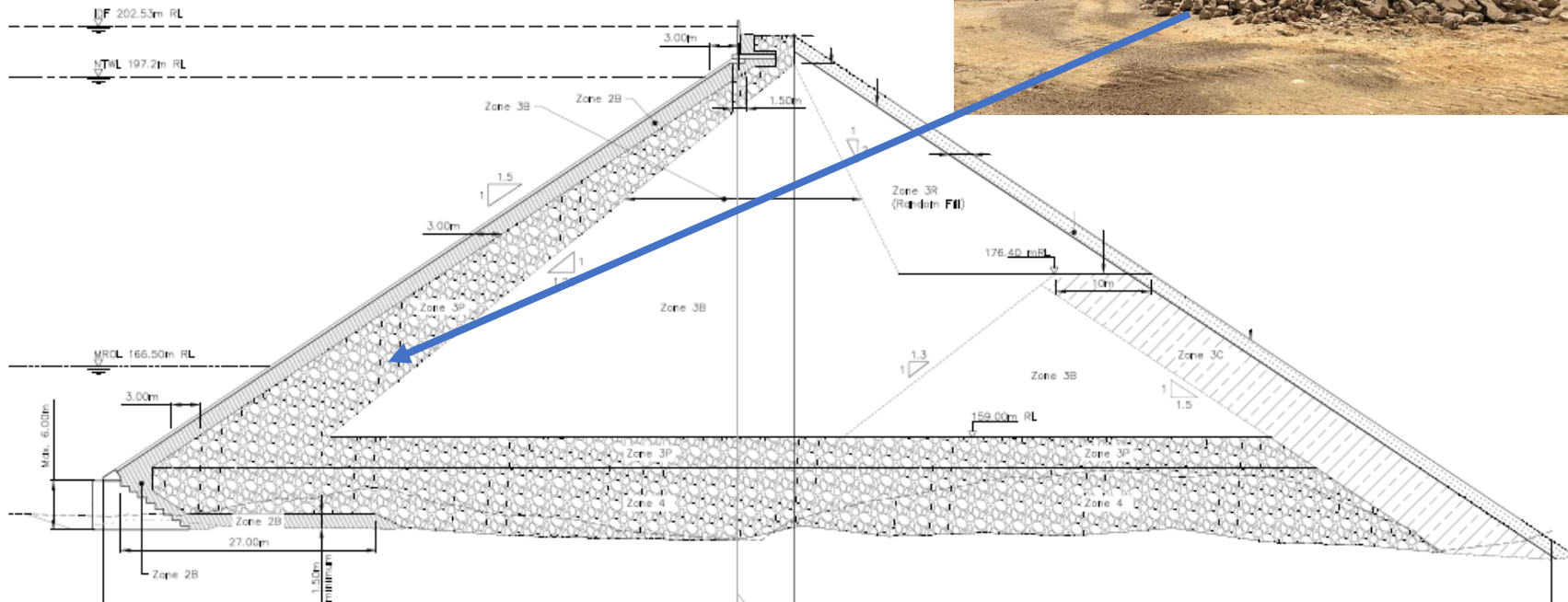
# Design Update

- **Rezoning:** Flexibility / robustness to geology
- **Spillway:** De-risk construction, topography
- **Plinth:** Optimised. Updated grout curtain
- **Membrane:** Enhance resilience. Savings
- **MechElect:** Progressing optimised design.
- **Bridges:** Remove upper-spillway. Savings



# Design: Rezoning embankment to manage geology

- ❖ Expect less harder class-1 material
- ❖ Experiencing more fines
- ⇒ Increase drainage layers with
- ⇒ Processed (screened) out fines



# Design: Geosynthetic membrane

Considering replacing concrete face with Geosynthetic membrane

- ⇒ Improved **resilience** to settlement and seismic (elasticity)
- ⇒ Cost and schedule **savings**
- ⇒ CO2 reductions
- ⇒ Performance warranty

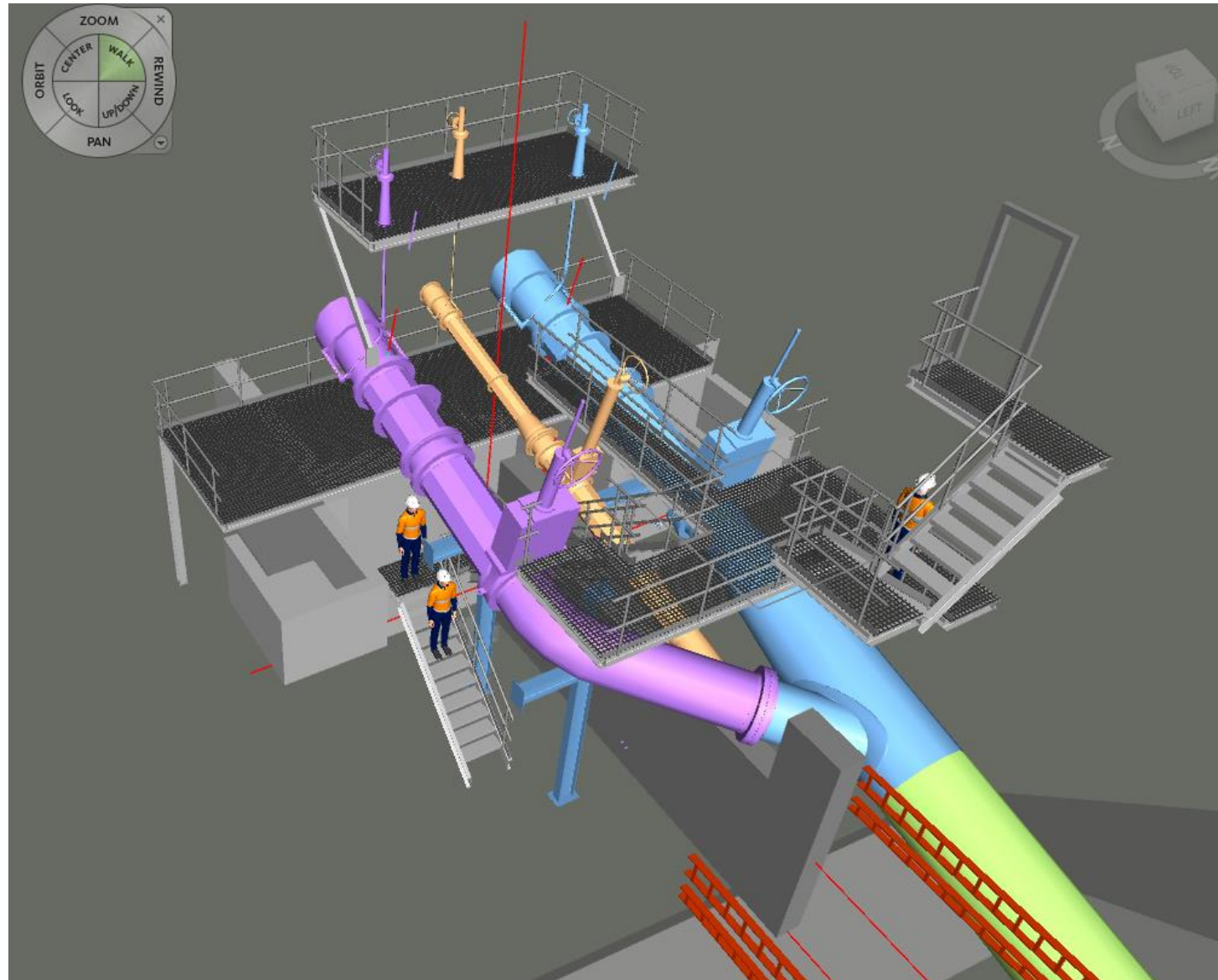
Carpi Ltd: Installed

- 54 New Dams since 1988 (26 larger than Waimea)
- 142 Retrofitted Dams since 1970 (63 since 2010)



# Design: Mechanical design completed

- Low and mid-level GRP draw off  
⇒ Water quality and temp control
- Single pipe through 160 m culvert
- 3 nozzles at outlet  
⇒ Environmental to flushing flows
- Powergen compatible



# Construction: Proceeding as planned



# Construction: Culvert Construction

- ~80/160m of culvert cut excavated and pouring blinding concrete poured to 60/160m
- Construction of 160m long 5x4m culvert commenced Nov-2019. Poured 2 X 10m floor sections
- Divert river May-2020. Exploring options to expedite



# Construction: Preparing for LHS Plinth. As expected



# Construction: Clearing RHS Abutment. As expected



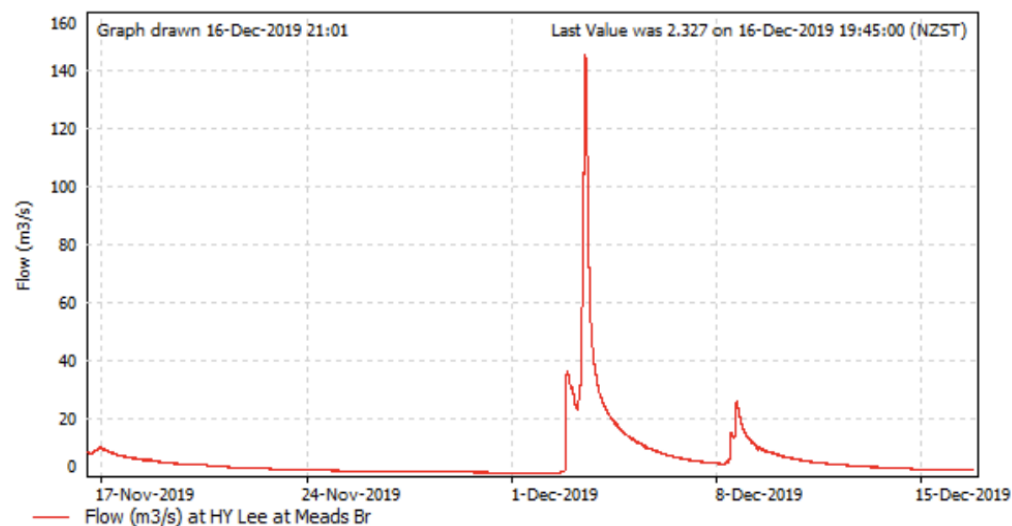
# Construction: Permanent Slope Protection progressing



# Construction: Flood risk is very real

2 December: 102 m<sup>3</sup>/s (1:50 = 250 m<sup>3</sup>/s; 12 May 2019)

- Temporary works designed to overtop
  - Cofferdam protecting embankment
  - Downstream reinforced mesh dam
- Expect >8 flood events



# Environment and Sustainability

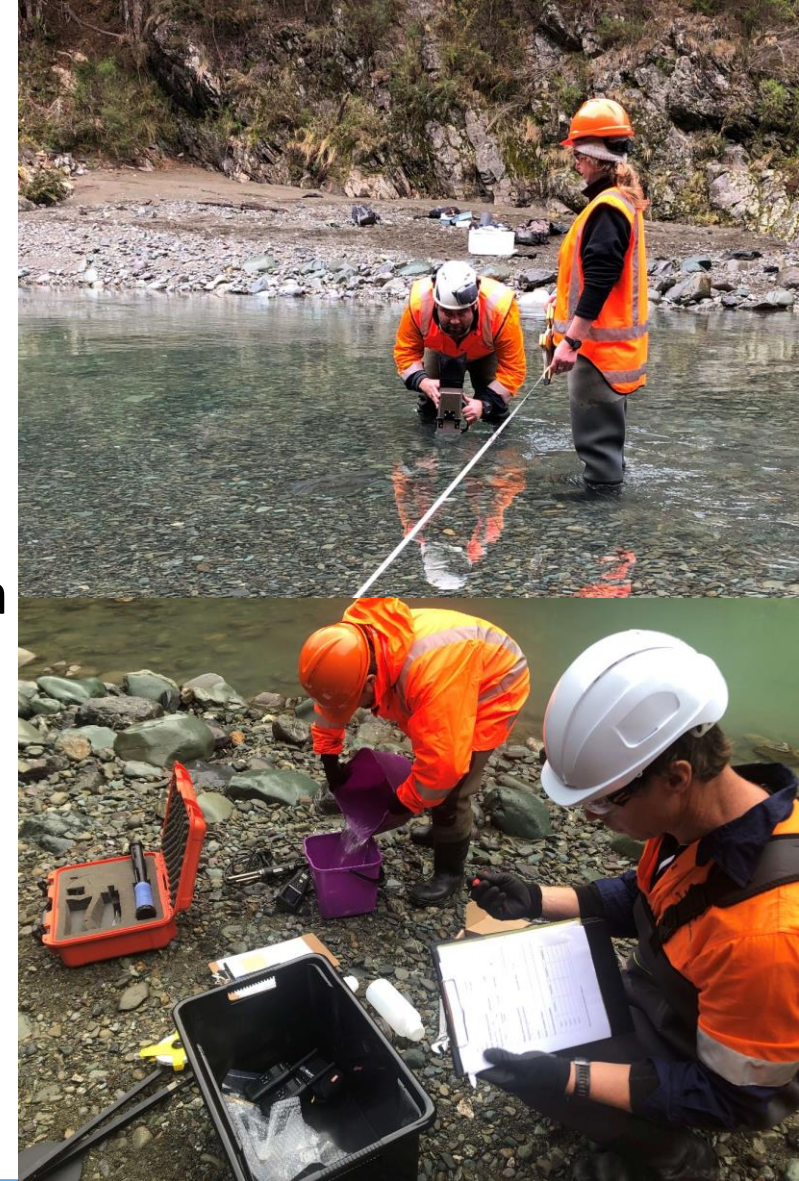
- 164 Resource Consent conditions; Working 99 action items
- Biodiversity Management Plan approved with 8 plans. BTAG

## Onsite

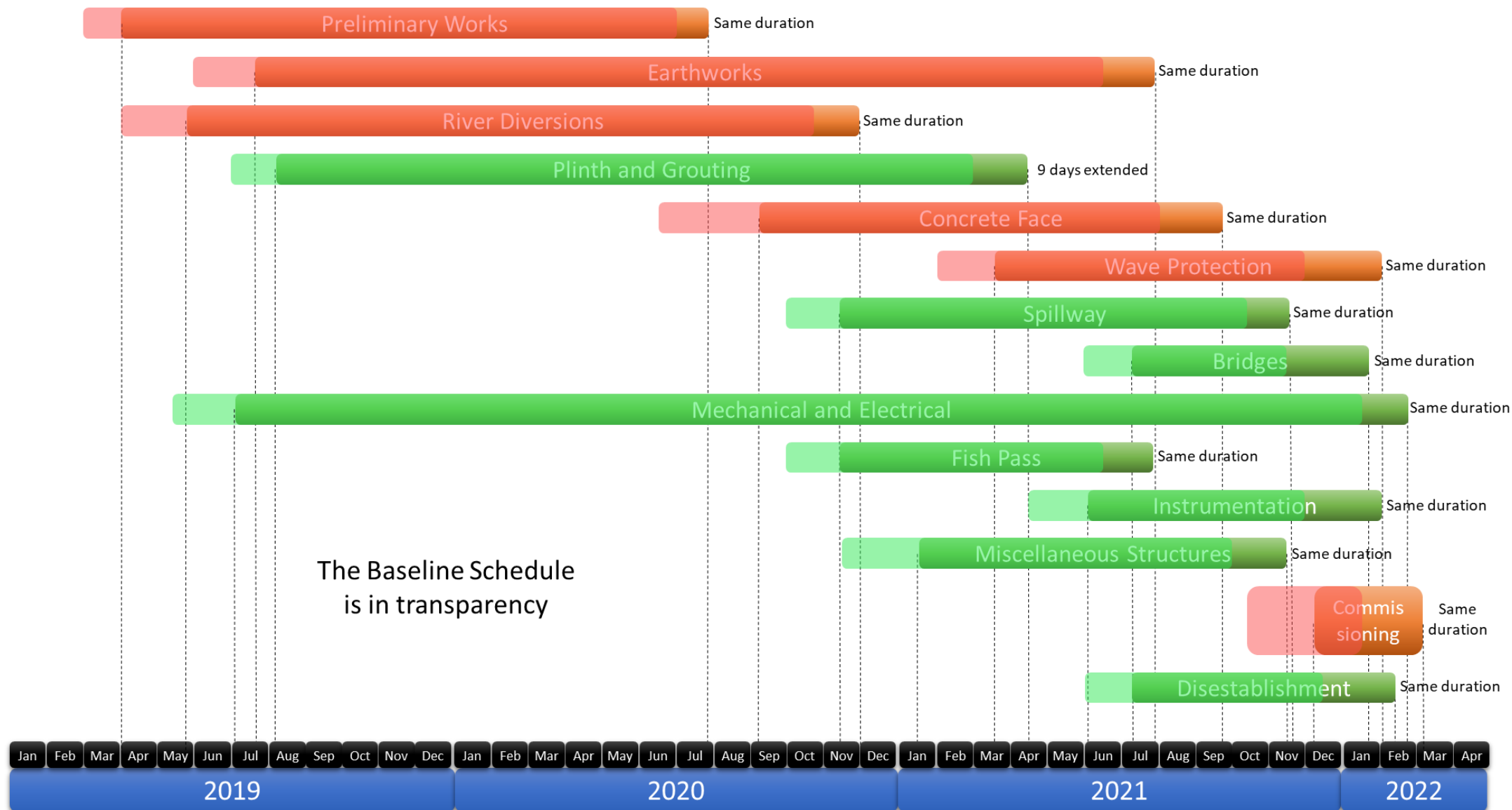
- 7/9 SCEMPS approved, implemented and being monitored
- 6 Sediment Retention Ponds & 7 Decanting Bunds operating
- Hydroseeding & mulching mitigates erosion and sedimentation
- Fortnightly independent water quality monitoring complies
- Continuous turbidity monitors guides river works
- 3/4 rare plant species removed for propagation (BMP #2)

## Offsite

- Ordered 11,000 plants and weed control for Rough Island



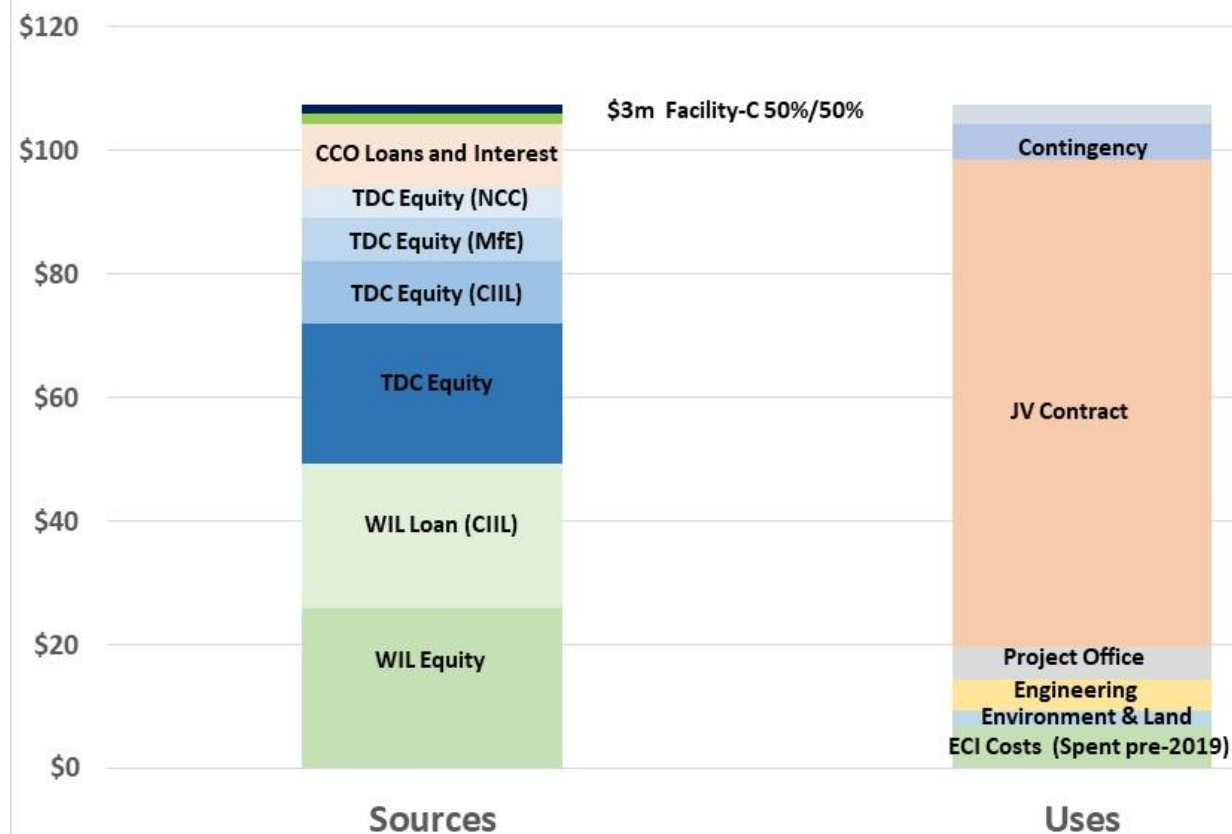
# ~ 2months behind; seeking opportunities to recover



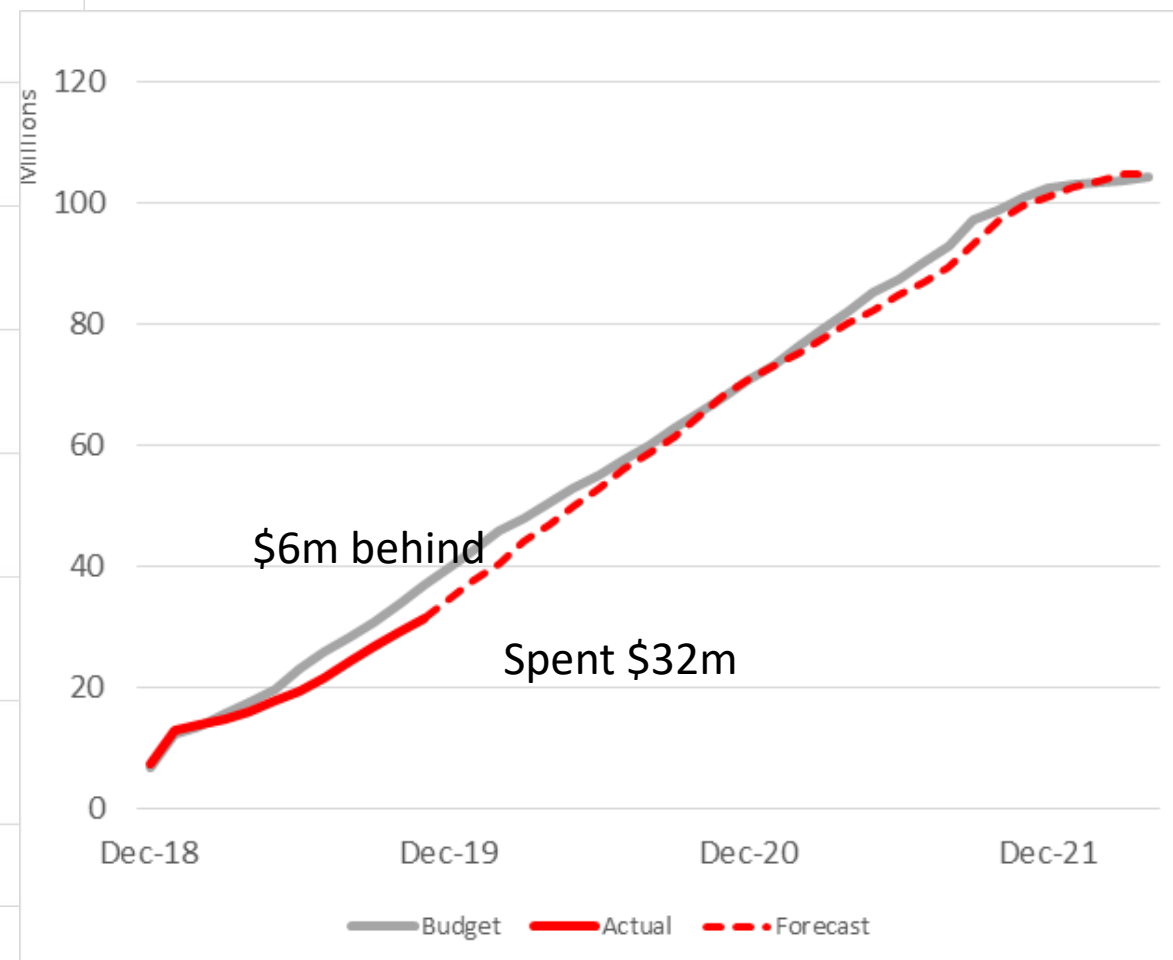
# Funding and expenditure

## Funding and Spend

WWL Sources and Uses of Funding (\$M)

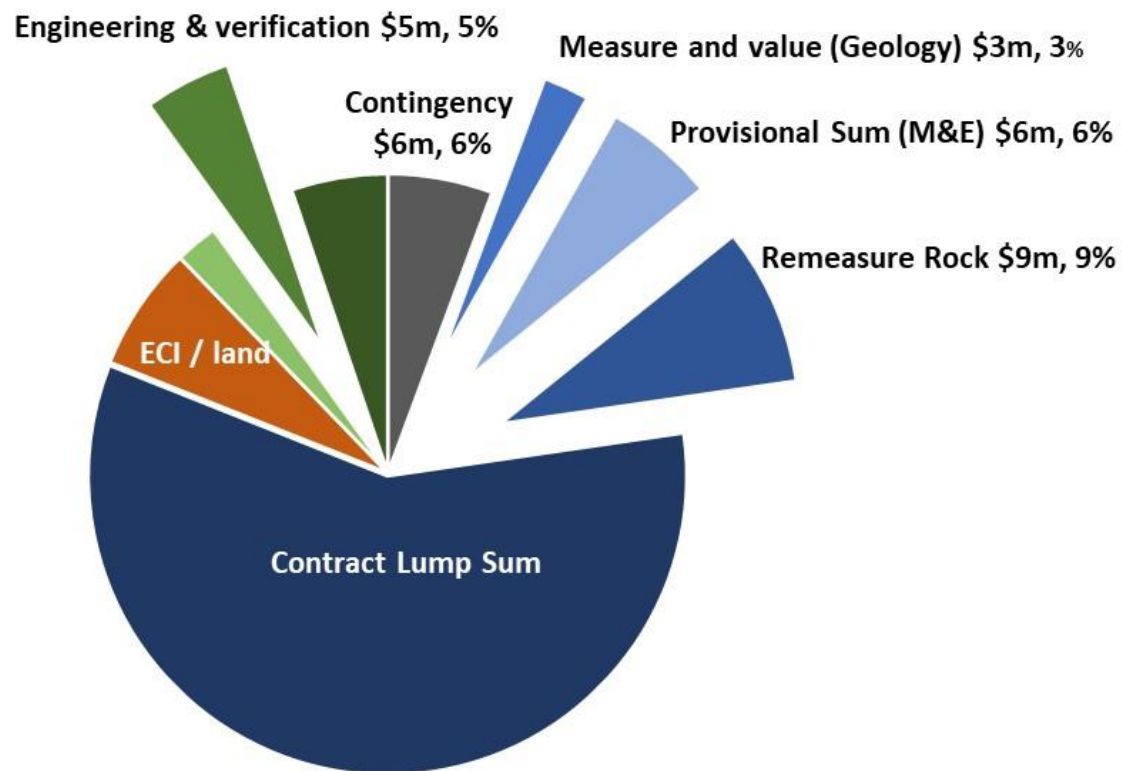


## Forecast cost & schedule to complete



# Managing key risks

Risk Management: 22% of Project Budget at Risk



## Risk Heat Map

		Threat				
		Very Low	Low	Medium	High	Very High
Likelihood	Very High	-	1	-	-	-
	High	1	3	3	6	-
	Medium	1	4	6	3	1
	Low	-	1	3	-	-
	Very Low	-	-	-	1	-
		Very Low	Low	Medium	High	Very High

### High Risks:

- Rock fill into embankment
- Grout subsurface
- Topography on Spillway
- Slope stability
- M & E Design

### Mitigating Actions:

- Rezoning, trials, bores
- New grout & plinth design
- Spillway design
- Assessing
- Optimising (1 pipe)

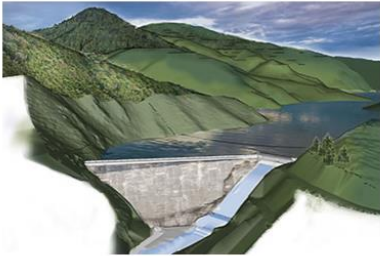
# More Information

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Recent events



Check out the key facts about the dam



Read more news about the dam



Construction update



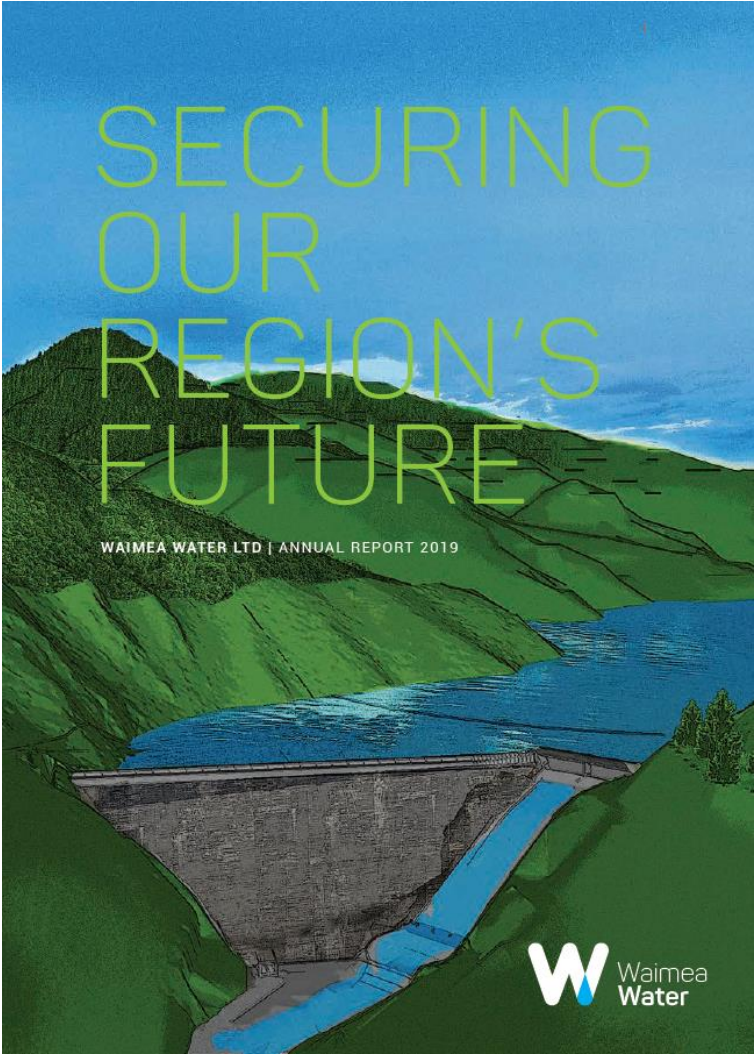
Latest reports and presentations

**Waimea Community Dam  
INFORMATION EVENT**

Richmond Town Hall  
9 Cambridge Street  
Wednesday 25 September  
7:00 to 8.30pm

[DETAILS →](#)

Upcoming events



# Questions?

- ~ 2 months behind with late start: Pursuing opportunities to recover
- So far, have not encountered anything that exceeds funding envelope

**BUT (health warning)**

- Early days, and significant geological and topographical risks exist
- Expect to have better understanding on cost & schedule mid-2020

**Waimea Water Ltd**

# Design: Highest category (NZSOLD / ANCOLD / ICOLD)

- Concrete Faced Rockfill Dam; most robust to seismic loads and uses indigenous material
- 13 Mm<sup>3</sup> (13 billion litre) reservoir; 53m high; 220m crest length; 430,000 m<sup>3</sup> rock
- Earthquake: Operating basis 1:150 AEP (years); Seismic evaluation basis 1:10,000 AEP (years)
- Flood: Probable max: 1094 m<sup>3</sup>/s (100 yr 375 m<sup>3</sup>/s). 12 May 2019 1:50 year 250 m<sup>3</sup>/s (47 mm/hr)



3-D model overlaying existing site topography



Turitea Concrete Faced Rockfill dam. Palmerston North  
Constructed 1907, 1912, 1996