# Paradise Dam Options Assessment

## Briefing

DAMIAN GOULD, CHIEF EXECUTIVE OFFICER

25 March 2020

# Background

# Background

- Essential works announced 24 September 2019 to maintain community safety
  - immediate reduction in water level to 42%
  - five metre lowering of primary spillway.
- Building Queensland engaged October 2019 to report by February 2020 on long term options for the dam to:
  - maintain community safety
  - ensure water security for the region for future economic growth.

# Options assessment scope

- Five long-term options investigated:
  - Option 1: maximum primary spillway height
  - Option 2: reduce maximum primary spillway height by 5 metres
  - Option 3: reduce maximum primary spillway height by 10 metres
  - Option 4: reduce maximum primary spillway height by an optimised level
  - Option 5: decommission the dam.
- Options assessment comprised of two complementary work packages:
  - Design, cost and risk review
  - Service needs, demand estimates and options assessment.

# Summary of findings

# Design, Cost and Risk Review

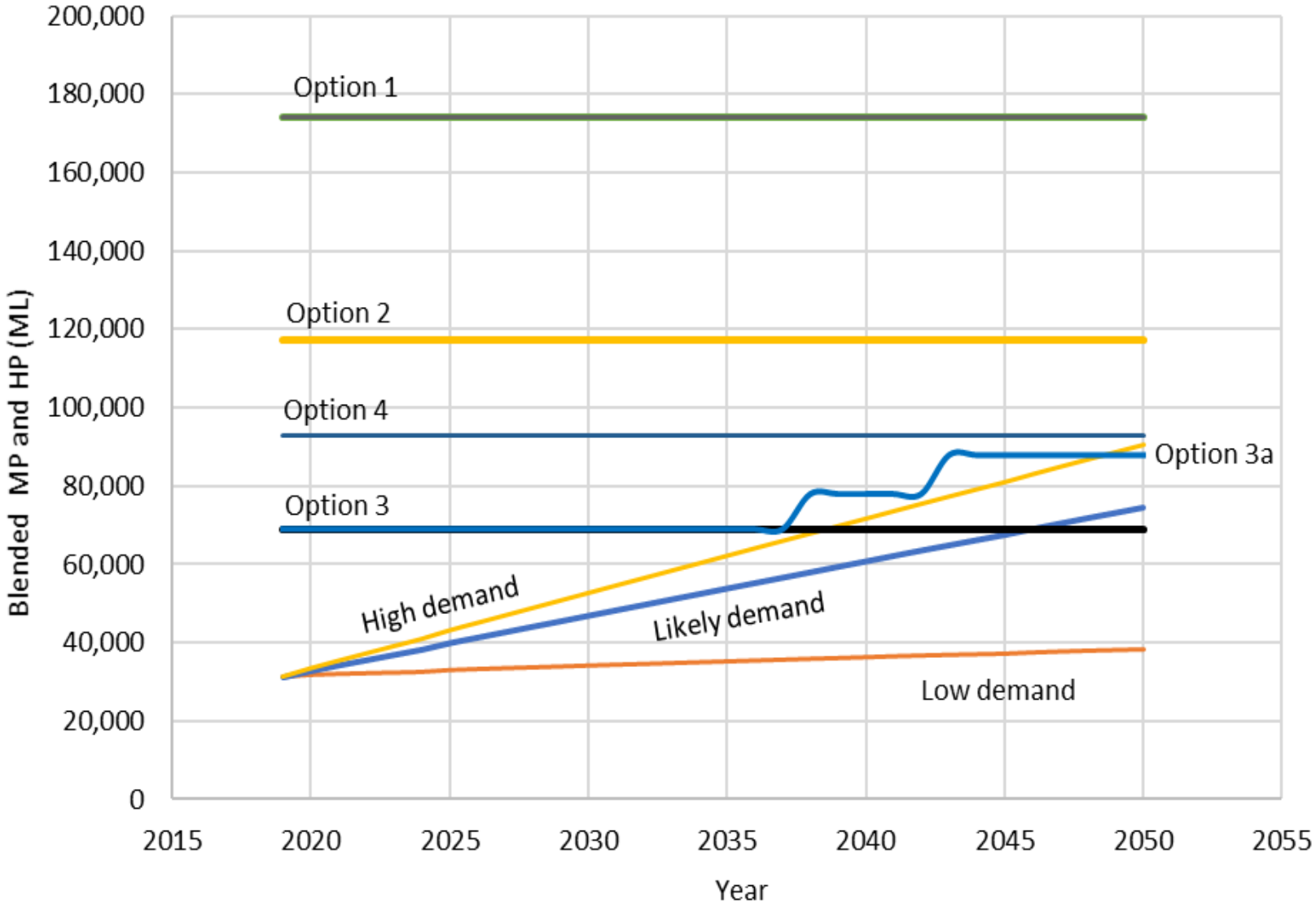
- Independent review undertaken of Sunwater's technical information
- Sunwater's understanding of the condition of Paradise Dam is thorough
- Methodologies used to perform design are in accordance with ANCOLD guidelines
- Designs for options 1-4 were based on some assumptions relating to the condition of RCC and dam foundation
  - these conditions should be further investigated through sampling and testing to inform the more detailed design stages
- The state of completeness of designs varied across the options
  - further develop preliminary designs and cost estimates for the options using the final primary spillway level at the completion of the essential works.
- Further work required (geotechnical assessments, RCC sampling and testing, anchoring trials) to confirm design parameters

# Demand assessment - scope

- Assessment of likely demand was undertaken to determine the ability of the options to provide for the future water requirements of the region, including:
  - an assessment of broader macro factors driving demand (e.g. demographics and economy, trends in commodity markets and prices, land use and climate change)
  - econometric analysis of historical usage
  - detailed assessments of prospects, trends and water requirements for major irrigation crops
  - detailed assessments of urban and industrial demand for High Priority allocations
  - targeted consultation with stakeholders within the region, competing regions, and entities along the supply chain for key commodities.

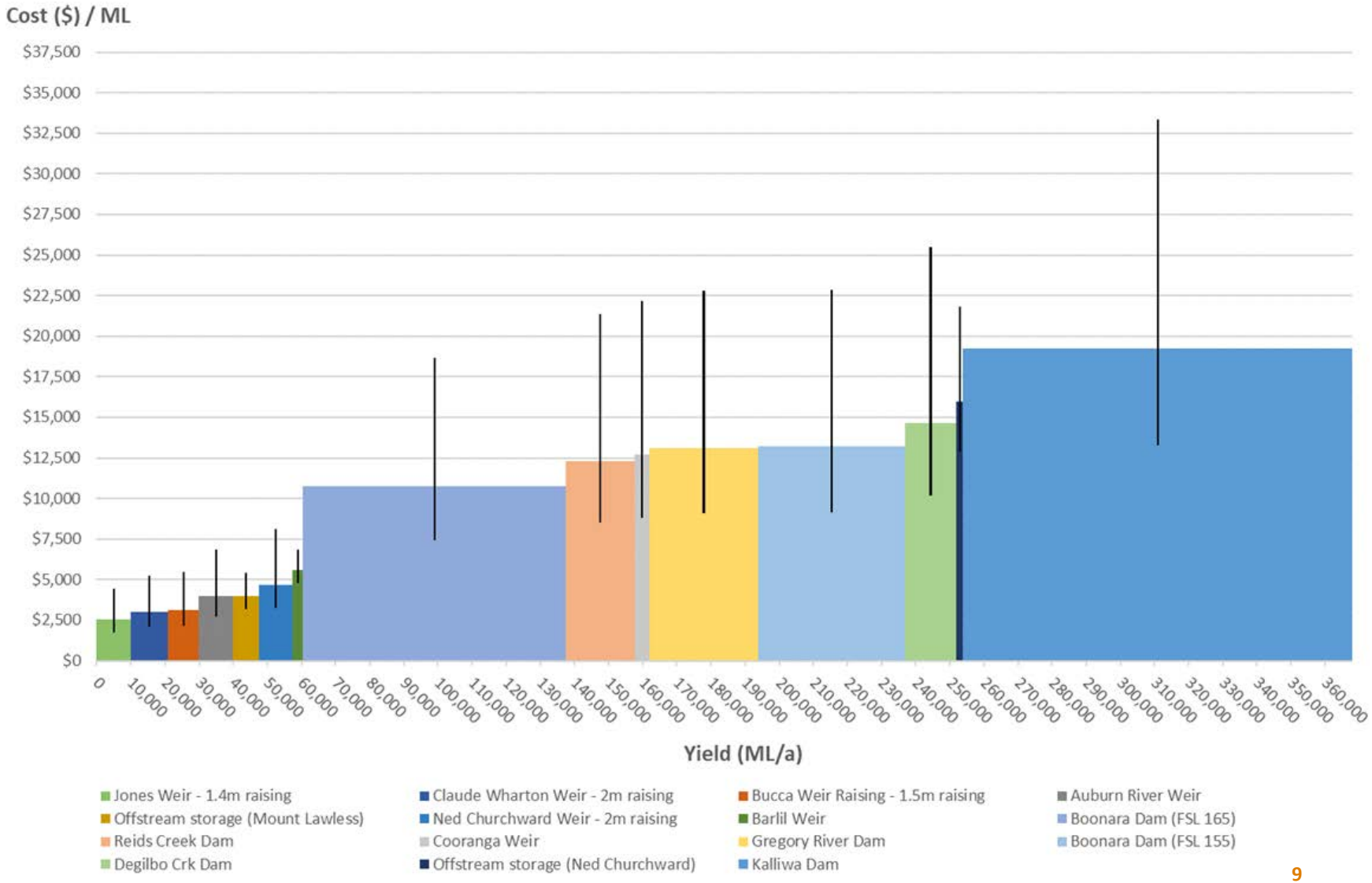
# Demand assessment - findings

- Assessment of future demand out to 2050
- Main demand driver is crop substitution - sugar cane to high value perennial tree crops
- High demand below supply available from options 1 and 2
- Alternative water supply options may complement some options.



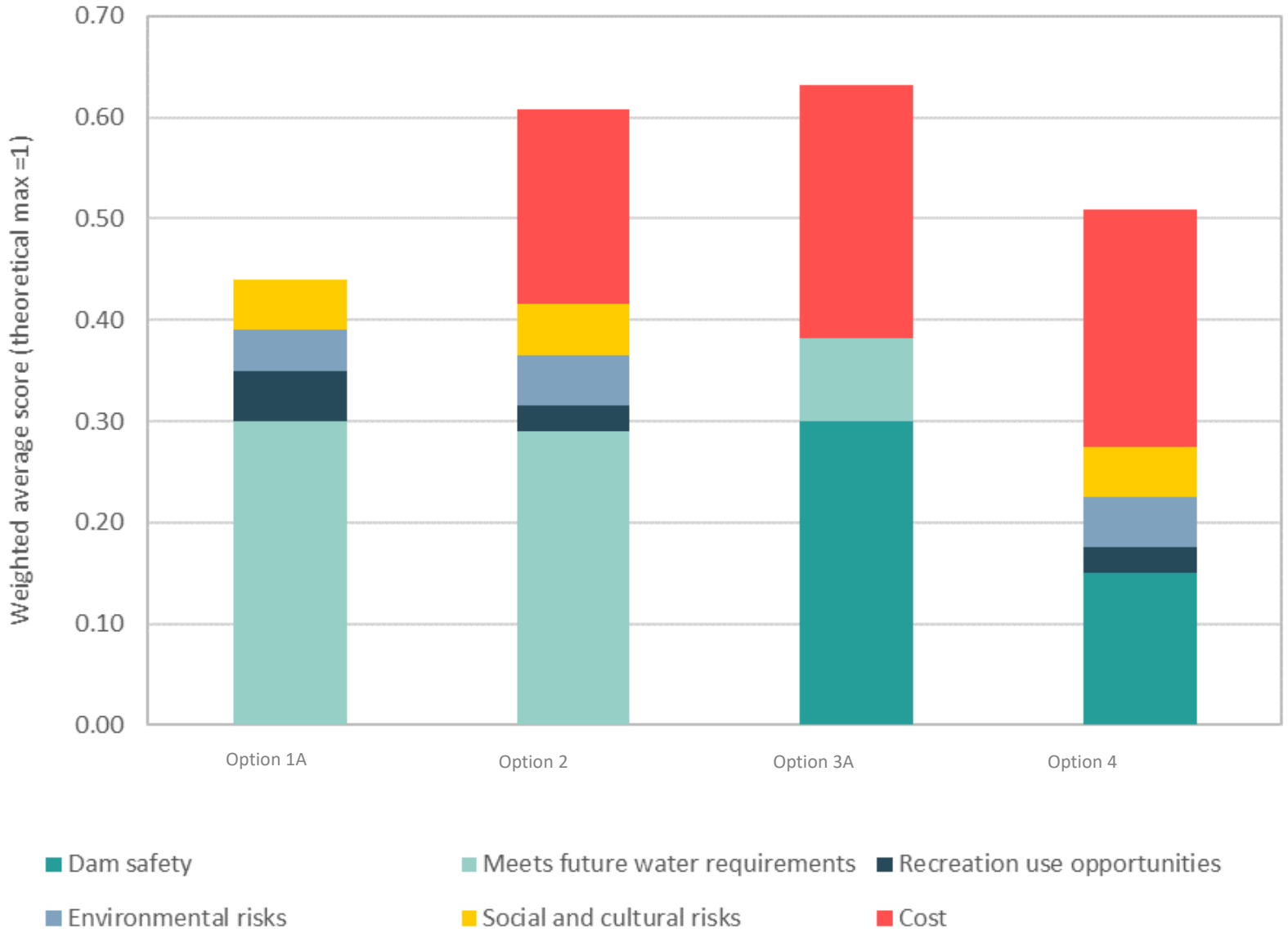
# Alternative storages in broader region

- Demand could be met from a lowering and a portfolio of alternative supply options being assessed under Sunwater Blueprint process
- Some within current Scheme area (Bucca Weir raising, Ned Churchward Weir raising, Ned Churchward Offstream Storage).



# Options assessment

- Options filtered
  - Option 1 did not meet dam safety threshold
  - Options 3 and 5 did not meet water security threshold
- Remaining options scored against service needs
  - Weighed scoring – most important criteria received larger scores.



# Recommendations

# Recommendations

- Sunwater continue to progress investigations (geotechnical investigations dam foundations and 3D geological model and anchoring trials) to inform further development of preliminary designs and cost estimates for three options:
  - maintain primary spillway height at the level of the essential works (nominally 5m below existing spillway level prior to the essential works)
  - raise primary spillway height to an optimal level (up to the existing full supply level prior to essential works)
  - lower the primary spillway height to an optimal level (down to a maximum of 10 metres below the existing spillway level prior to the essential works) and explore alternative water supply options.
- Dam decommissioning is not recommended
- Building Queensland to undertake a further detailed demand assessment including further community consultation
- Building Queensland investigate the yield required to meet water security expectations.

# Impact of essential works

- Base case for all design and cost information available at the time was on current condition of dam (maximum primary spillway height equivalent to RL67.6m)
- Essential works results in a new base case – condition of the dam at the completion of the works (primary spillway height consistent with Option 2)
- Options require update to designs and costs – variable impact on each option
- Analysis and assessment of options (relative to new base case) will be fully considered in recommended further work for progression to detailed business case.

# Next steps

- Building Queensland and Sunwater complete further investigations.
- Outcomes then to be presented to government for endorsement of the final recommended option(s) and subsequent development of the detailed business case.

# Thank you

www.buildingqueensland.qld.gov.au

BUILDING QUEENSLAND