

Queensland Major Contractors Association

Snapshot of dam projects in Queensland

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Director Dam Safety

11 October 2023



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Drivers

- Societal disproportionality drives safety standards, regulation and a dam owner's duty of care
- Science of weather, growing downstream populations, ageing assets, new engineering techniques
- Climate change is emerging, non-stationary risk management required
- Recent regulatory change has reminded dam owners of their obligations
 - Dam owners required to justify and report upgrade timeframes every year
 - and say how long the risks have been known and track their progress
 - We think a major dam project should take 5 to 10 years, with outer limiting date of 2035
- Pumped hydro projects
 - 2x major dam projects, likely to be most significant dam projects in the state in the next 15 years
 - Will there be more pumped hydro? Likely
- Will drought concerns drive future dam projects?



Societal disproportionality and what it means

- As a society we do not tolerate dam failures
 - This is different from natural events like floods, cyclones or bushfires
 - This is more like unnatural events like Bhopal Disaster, Beirut port explosion, Brumadinho tailing dam failure, Derna, COVID(?)
- Dam safety standards reflect equity concerns and our personal and societal tolerance for risks
- Dam safety standards have little to do with economic considerations
- ALARP across the business (not just dams themselves)

History demonstrates that multiple fatality, human derived events:

- Provoke a disproportionate socio-political reaction above and beyond economics
- Cause political instability, loss of confidence and trust, trauma, disruption to the social fabric
- Often trigger step-changes in public safety policy



What truly grips us in these accounts is not so much the numbers as the spectacle of suddenly vanishing competence, of men utterly routed by technology, of fail-safe systems failing with a logic as inexorable as it was once—indeed, right up until that very moment—unforeseeable. And the spectacle haunts us because it seems to carry allegorical import, like the whispery omen of a hovering future.

Brazil prosecutors charge 16 people with murder in dam collapse that killed 270

- Former CEO of mining giant Vale among those charged
- Vale 'acted directly to create false impression of safety in dams'



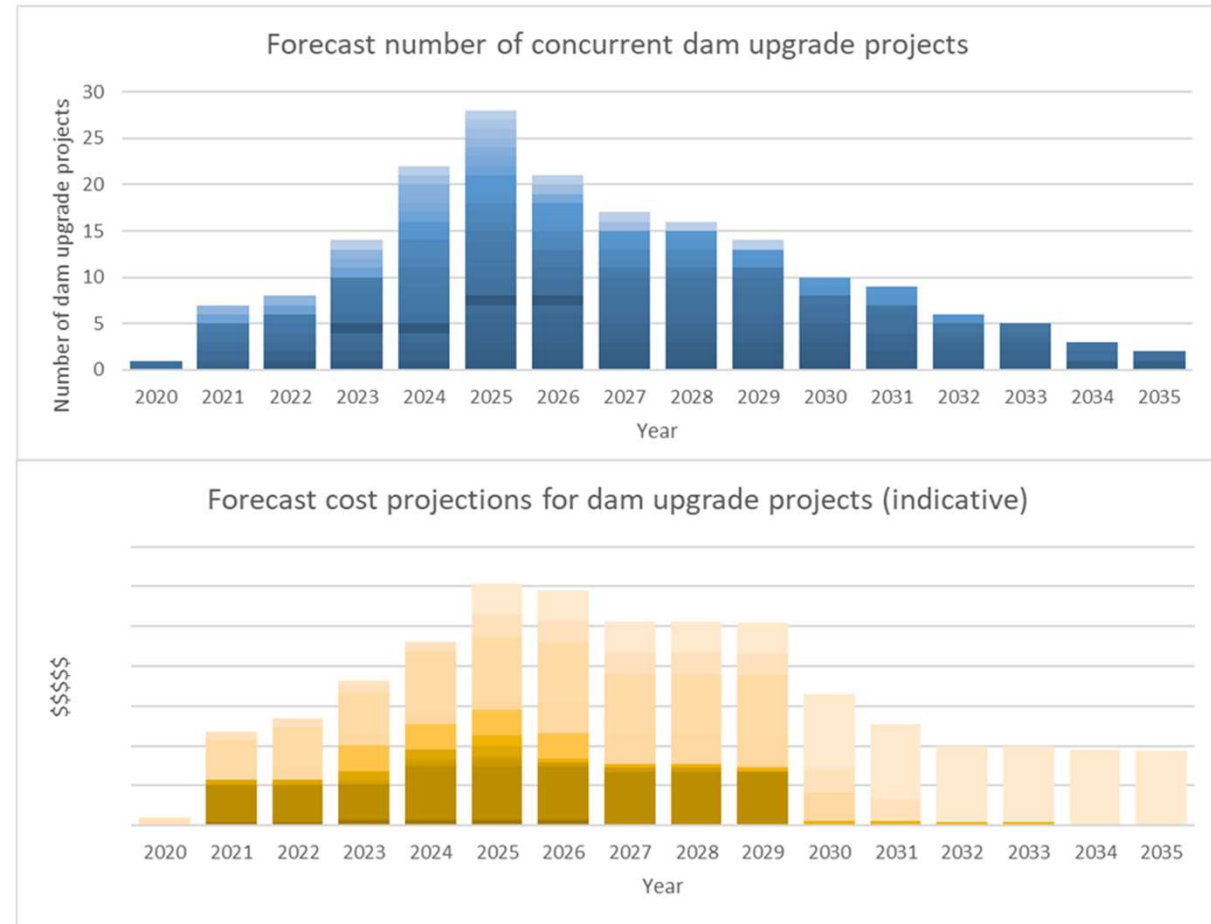
August 3, 2021

“They Killed Us from the Inside”

An Investigation into the August 4 Beirut Blast

Snapshot of dam projects between now and 2035

- Final number still uncertain
 - 16 dams above societal limits of tolerability (prioritised)
 - 14 dams below societal limits of tolerability but need ALARP assessments (may need upgrade)
 - 40 dams below societal limits of tolerability but need ALARP assessments (probably don't need upgrade, to confirm)
 - At least 2 major pumped hydro projects
- What it shows
 - Peak demand for dam projects anticipated between 2025 and 2030, likely to stretch
 - Big projects dominate - 5 out of 38 projects contribute to around 80% of total cost estimate
 - We need more dam builders than we currently have



Key messages

- There is a solid pipeline of dam projects to be completed between now and 2035
 - 16++ upgrades and 2x pumped hydro
 - CC impacts add to the mix
 - Annual upgrade reporting requirements will continue to provide reliable forecast information
- We need more dam builders
 - Significant industry investment in dam projects in Queensland in the coming 15 years with commensurate demand for labour, plant and materials
 - Will the industry “fill out” existing local skills and capabilities, bring in more resources, learn from international experience and deliver it locally?
- Dams are hard to build
 - Risks need to be managed with maturity and openness - many risks are not realised until construction commences
 - Dams need good skills, experience and capabilities
 - Bring together international expertise and local knowledge



Queensland Major Contractors Association Breakfast

Tuesday 10 October 2023

Mal Shepherd, Chief Development Officer

We service more than

5000

customers



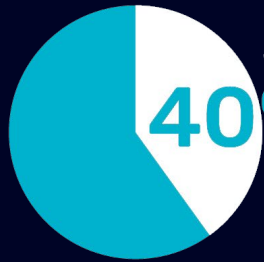
Irrigation



Industrial



Urban



40%

We supply around
of the water
used commercially
in Queensland

600+ people across
33 locations



50%

Half of our people live and work in
regional Queensland

We operate
365 days



per year to deliver the **lifeblood**
of regional Queensland

On average, we deliver more than
1300 gegalitres of water each year



that's enough water to fill

Sydney Harbour 3 times

Capacity of **6715** gegalitres of water storage in dams, weirs and barrages



19 dams



64 weirs and
barrages



595 kilometres of
water channels



70 major
pumping stations



1951 kilometres
of pipelines



6 water
treatment plants

sunwater

Infrastructure projects - what's happening now and in the short-medium term

Rookwood Weir

- More than 98 per cent complete
- Delivered through an alliance
- Involved construction of the weir and six ancillary projects

Burdekin Falls Dam Improvement and Raising project

- Improvement works to:
 - ensure dam long-term viability
 - align with safety requirements
- Two metre dam raise to increase water supply and support future demand

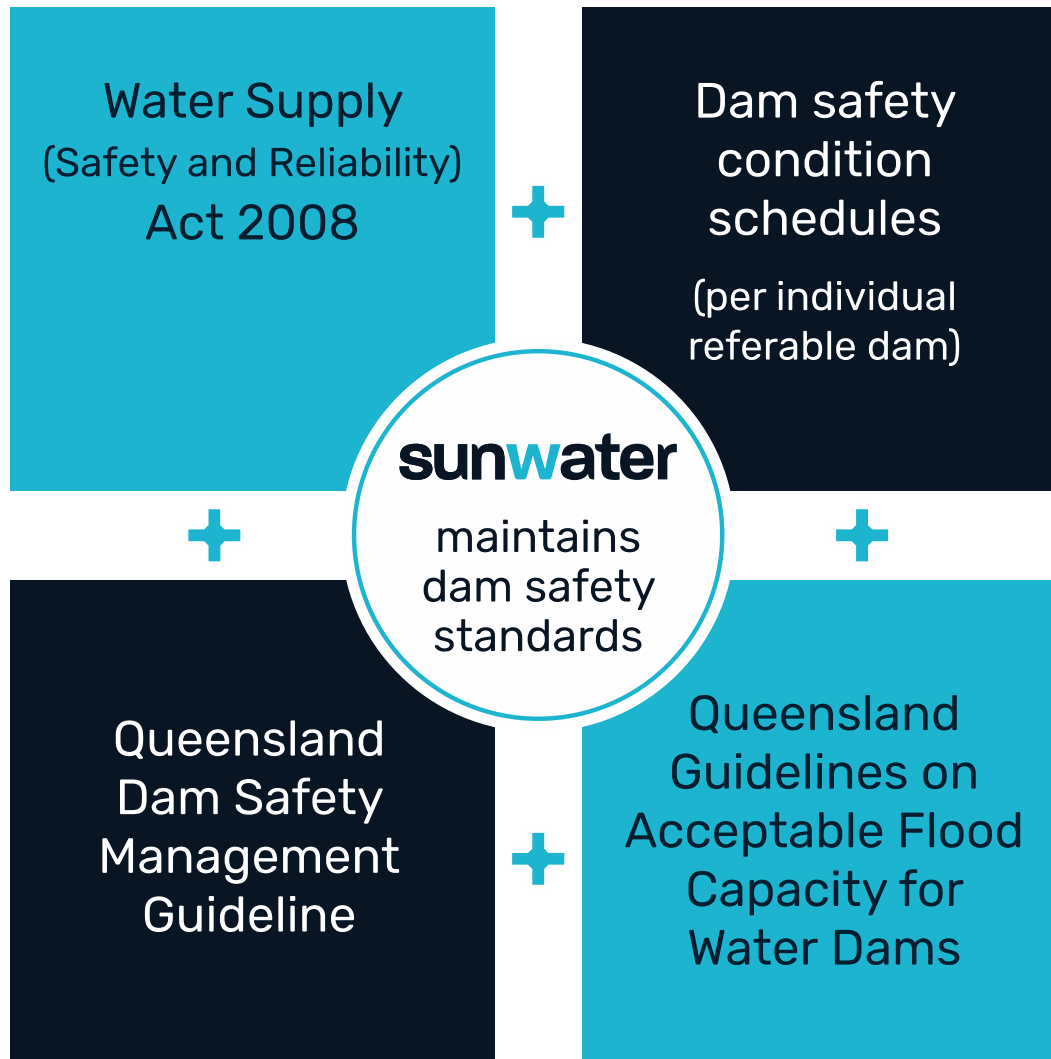


Rookwood Weir Project, Central Queensland — near-complete



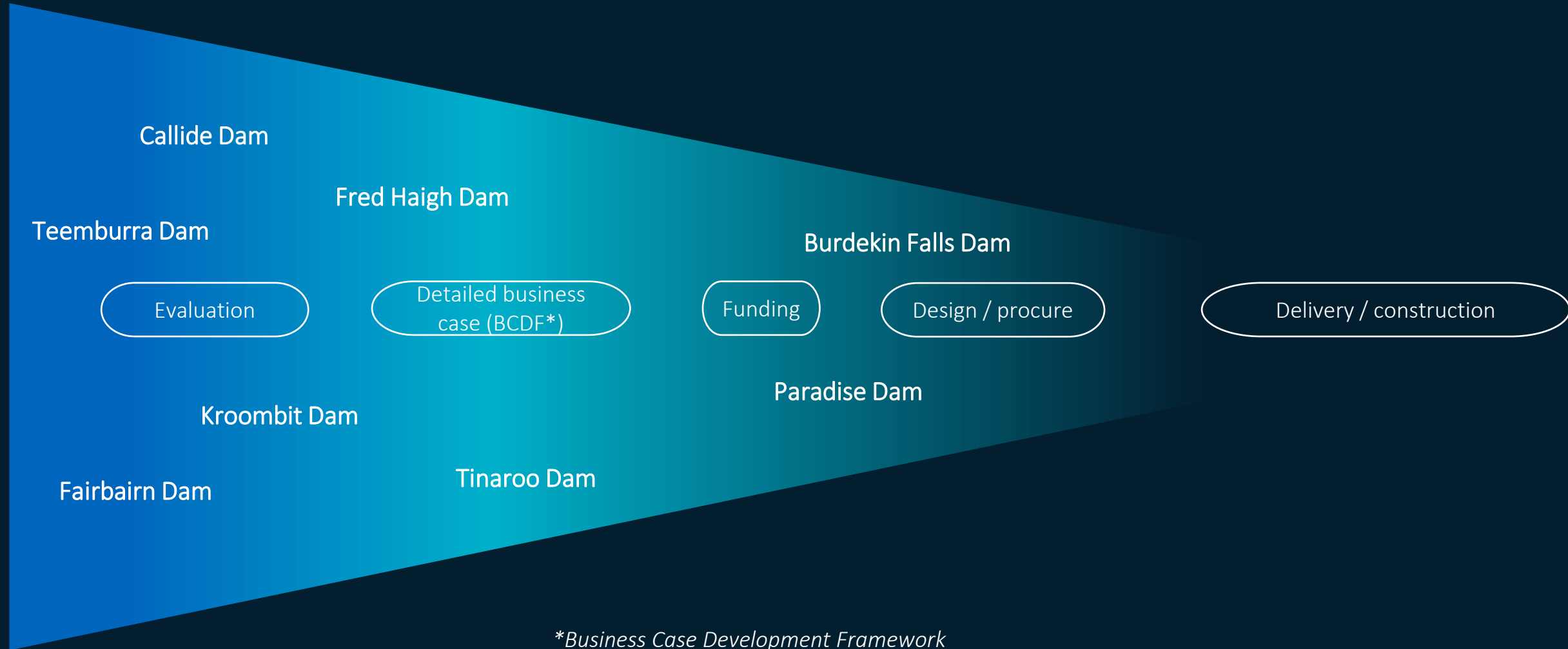
Burdekin Falls Dam Improvement and Raising project — planning

Dam Improvement Program framework



Fairbairn Dam Improvement Works, 2020
sunwater

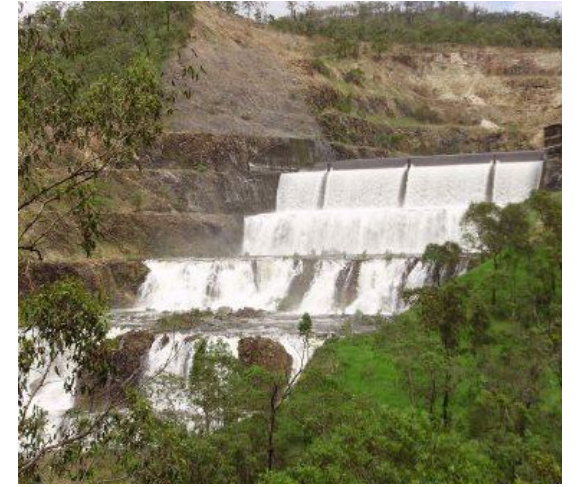
Dam Improvement Program



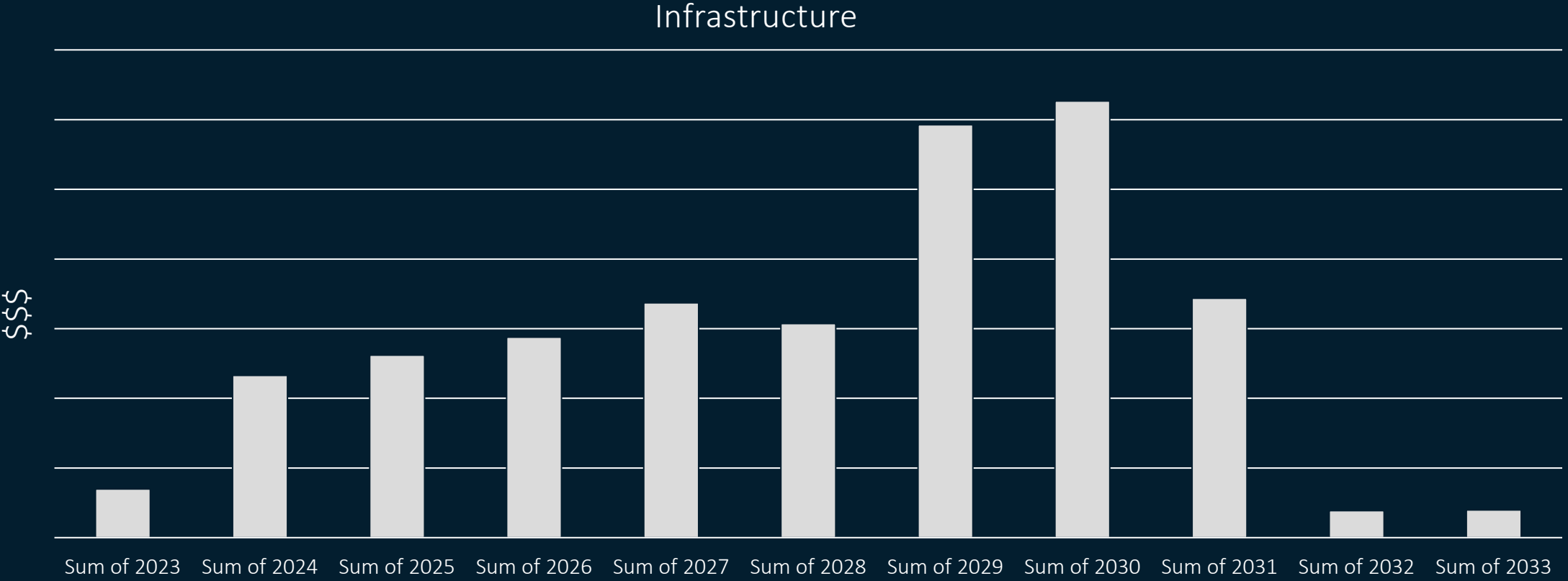
Indicative graphic only for information and planning purposes only and subject to change. Not accurate in order.

Works required in coming years

- Buttressing
- Tunnelling
- Anchoring
- Raising spillway height
- Geotechnical
- Upgrades to existing electrical and mechanical equipment



Scale of investment profile



Skillset requirements

- Skilled and semi-skilled labourers – concreters, form-workers, earthworks, welders, etc.
- Specialist trades
- Equipment operators
- Local content focus
- Organisational focus on safety



Key risks and opportunities

- Remote locations across regional Queensland
- Working on assets in active river systems
- Concrete placement
- Temperature / humidity
- Construction material locality
- Escalation of costs
- Concurrent planned projects - roads, hospitals, 2032 Olympics
- Approvals



*Example of complex works on a spillway -
Sunwater's Coolmunda Dam Variable Counterweight Works*

What we are looking for

Partners with a shared common purpose and commitment to safely to deliver project works to the required quality and standards

- Demonstrated experience across disciplines
 - Collaboration across strengths
 - Alliance contracting models
- Look internationally – expertise in dam projects
- Aligning or staggering procurement
- Early engagement – from both sides



Rookwood Weir, delivered through an alliance
sunwater

Contact us

Website: sunwater.com.au/about/suppliers-and-contractors

Procurement phone: (07) 3120 0000

Procurement email: procurement@sunwater.com.au

Delivering water for prosperity

The background of the slide is a photograph of a large concrete dam with water flowing over it. To the right of the dam is a body of water, and to the left is a shoreline with some vegetation. Overlaid on the left side of the image is a large, light blue circle containing the main title. To the left of this circle is a smaller, solid blue circle containing the date. The entire left side of the slide is also covered by a dark blue overlay featuring intricate, traditional Indigenous Australian patterns in lighter shades of blue and green.

**October
2023**

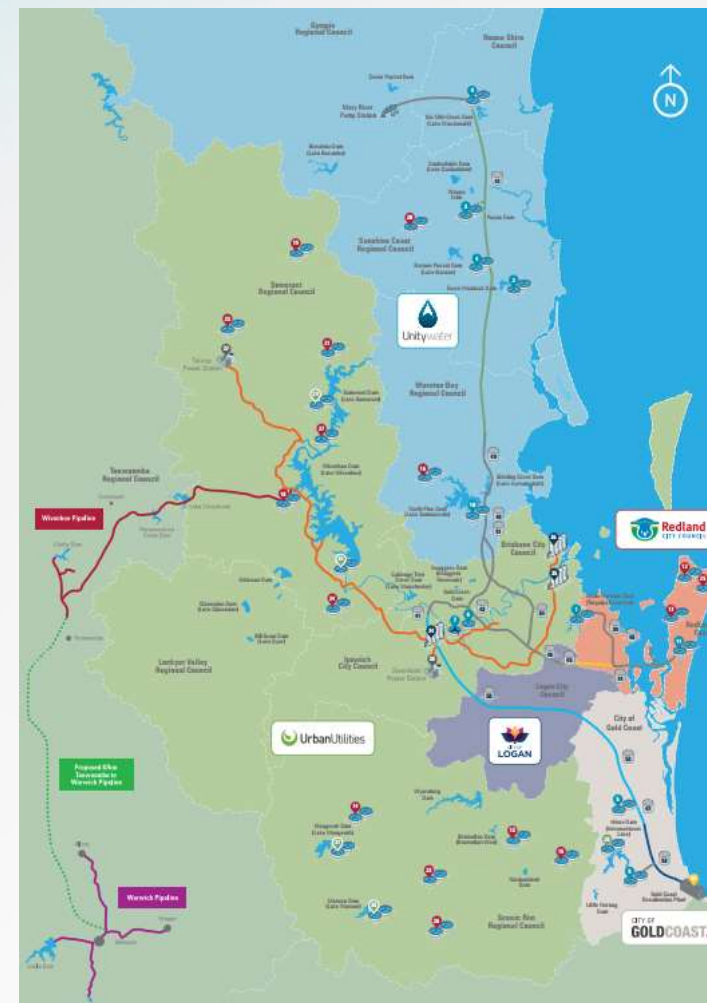
Seqwater **Capital Program**

**Queensland Major Contractors
Association Networking Breakfast**

Seqwater acknowledges the Traditional Owners of these waters and surrounding lands and recognises their continued connection to the land, waters and community. We pay our respects to them and their cultures and to elders both past and present.

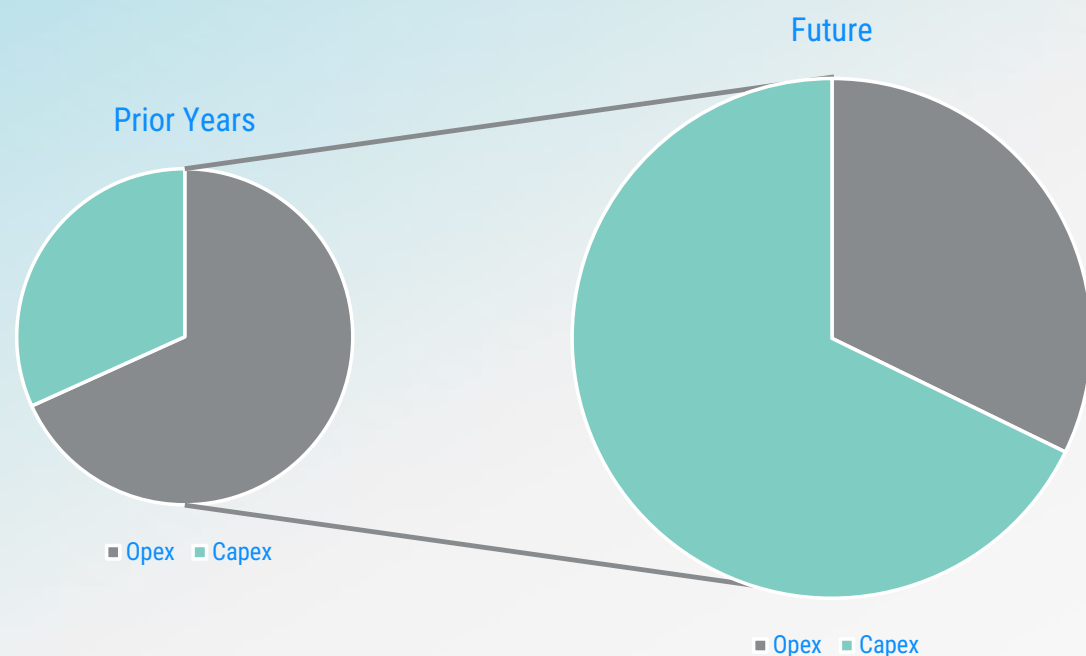
About Seqwater

- Seqwater is the Queensland Bulk Water Supply Authority responsible for delivering safe, secure and cost-effective bulk water supply for more than three million people across South East Queensland.
- The supply of water to your home is delivered by your local water service provider and council water businesses.
- We also:
 - provide essential flood mitigation services
 - manage catchment health and offer community recreation facilities
 - provide water for irrigation to about 1,200 farmers across seven water supply schemes.
- Seqwater is one of the largest water businesses with the most geographically spread and diverse asset base of any capital city water authority.



Capital Program

- The Capital Delivery Transformation Program was established in late 2022 to meet growth.
- Scale and scope of change is across all areas of the organisation.



- Average capital expenditure is increasing by a factor of 4 on an annualised basis.
- Total organisation expenditure is expected to significantly increase, with capital surpassing the annual operational expenditure.
 - Dam Improvement Program
 - Water Security Program
 - Other Major Projects
 - Baseline programs
 - Digital Technology

Baseline projects

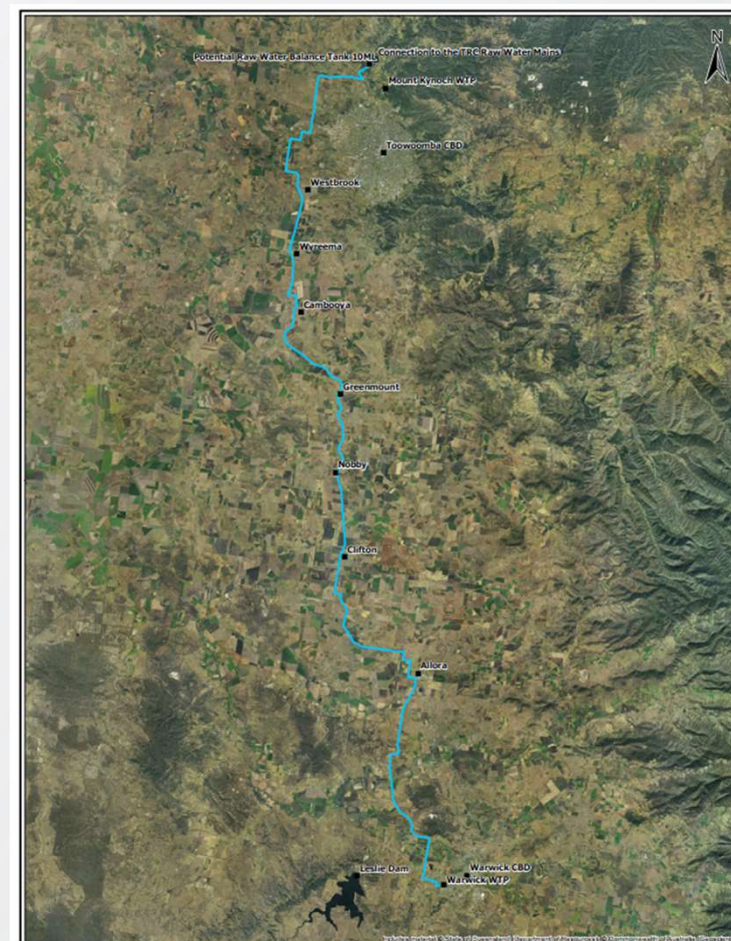
- Under our Capital Delivery Transformation Program, Seqwater is seeking to condense projects into bundles between \$5m and \$20m and deliver them by asset type.
- Types of projects include:
 - Water Treatment Plant upgrades
 - Roads and civil works
 - Electrical switchboard upgrades
 - Solar projects
 - Network infrastructure (pumping stations and reservoirs)
- Opportunities are advertised on QTender.

Toowoomba to Warwick Pipeline

- Around \$300 million Queensland Government funding committed for 109km pipeline to boost water security in the Toowoomba and Southern Downs regions.
- Will provide drought contingency to residents in Southern Downs Regional Council Area.
- New underground pipeline will transfer raw water from upstream of Mt Kynoch Water Treatment Plant (Toowoomba) to Warwick Reservoir (Leslie Dam).

Key construction activities:

- Pipeline supply and installation works (civil trenching and trenchless).
- Pipeline ancillary installation works.
- Reservoir installations.
- Pump station construction.



Toowoomba to Warwick Pipeline

Proposed milestones:

- Late 2023: Market briefing with Expression of Interest (EOI) to follow
- Early 2025: Construction to commence
- Early 2027: Practical completion.



Dam Improvement Program

- Dams are long-life assets which require continual assessment, monitoring and maintenance.
- Methodologies and data used to estimate extreme rainfall events have significantly improved and industry engineering standards and risks have progressed since dams were originally built.
- Across Australia there are multiple dam upgrades occurring to address these modern engineering standards.
- Seqwater's Dam Improvement Program will improve dam safety and water security for years to come.
- Upgrades are required to be completed by 1 October 2035 and planning is well underway.
- 13 dam upgrades already delivered.



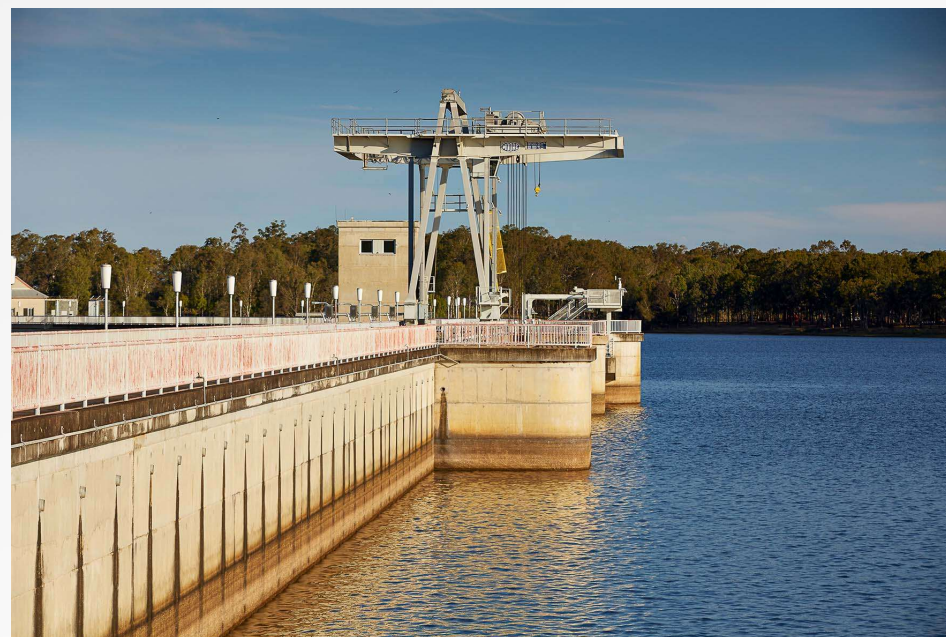
Lake Macdonald Dam Improvement Project

- Throughout 2021 and 2022, Seqwater worked with a Technical Review Panel to evaluate and shortlist options for the Lake Macdonald Dam Improvement Project.
- Comprehensive engineering, environmental and economic studies have been undertaken to inform the best design approach.
- Seqwater intends to finalise the preferred option and design by late 2023.



North Pine Dam Improvement Project

- An Options Analysis is currently underway to assess permanent structural upgrade options.
- The upgrade will aim to increase the dam's capacity to withstand extreme flood events while restoring all or part of the original storage capacity.
- Some staged enabling works are being considered which could be delivered ahead of the project.



Somerset Dam Improvement Project

- The Detailed Business Case for the preferred design is underway.
- As part of this work, extensive technical investigations and physical hydraulic modelling has been undertaken to inform design options.
- Some staged enabling works are being considered which could be delivered ahead of the project.

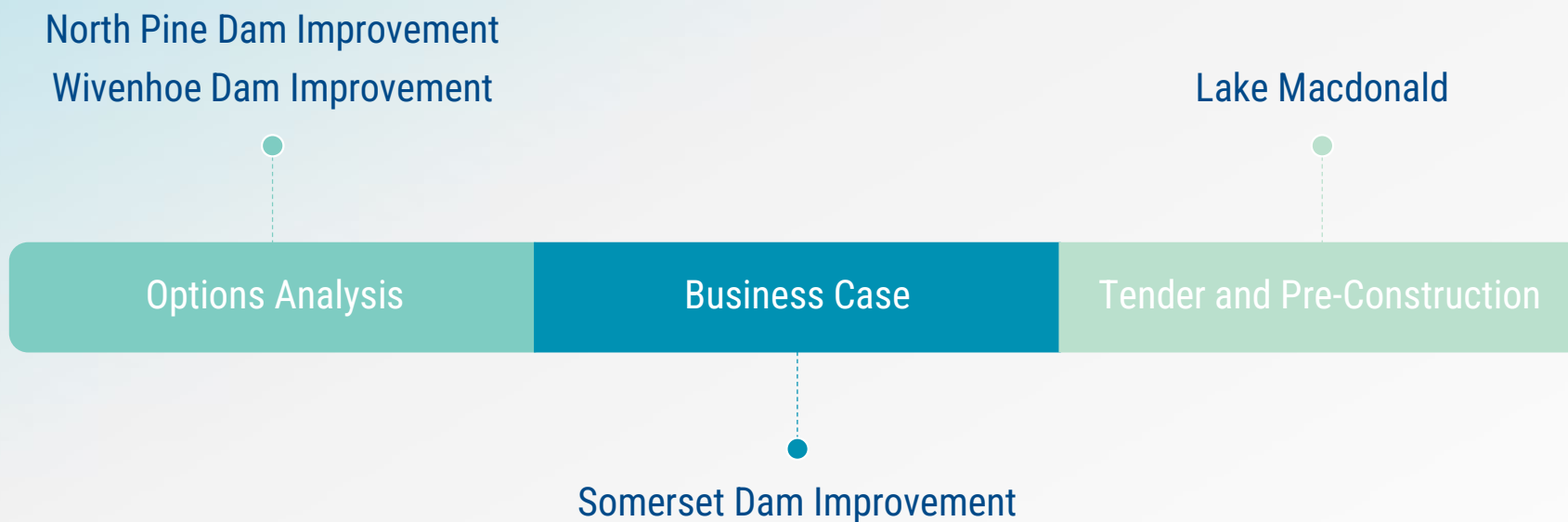


Wivenhoe Dam Improvement Project

- Somerset and Wivenhoe Dams operate as one system for both water supply and flood mitigation.
- Outcomes of the Somerset DIP Detailed Business Case will inform scope considerations for the Wivenhoe DIP.
- The Strategic Assessment completed in mid-2023 with Options Analysis underway.



Dam Improvement Program Status



Thank you

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