



# Dam Safety Engagement Session

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Manager Assets, Standards & Development



**GWM**

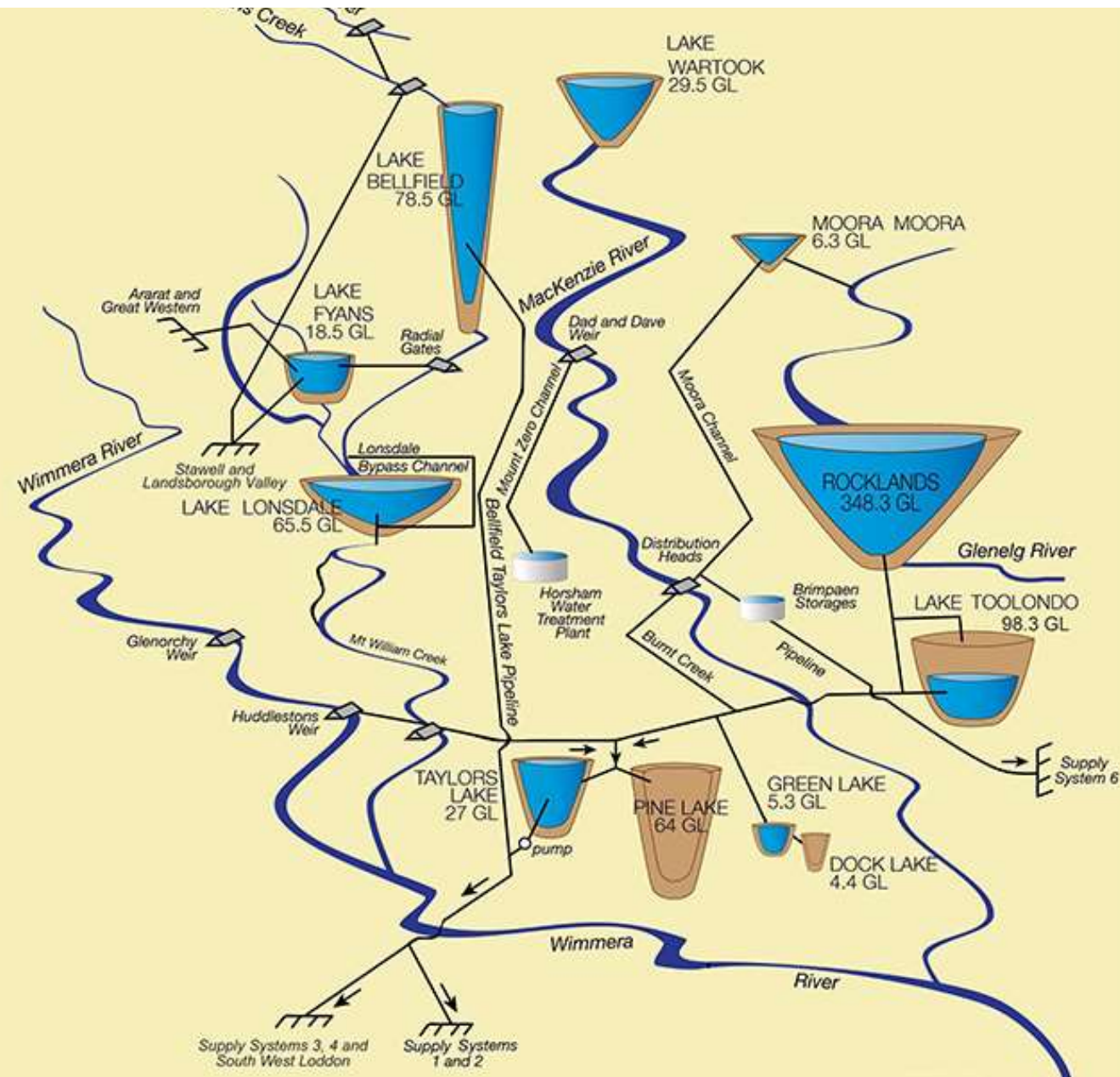
# Outline

- Dams & Water
- Dam Safety
- Lonsdale & Rocklands
- Funding arrangements
- Questions for the room



# Our Dams

- 174 'small' dams
- 10 'big' dams



# Water Sharing Arrangements

- Sustainable diversion limits
- Entitlements
- Allocations
- Storage Manager



# Dam Safety Obligations

- Water Minister
- DEECA - State Regulator
- ANCOLD Guidelines
- Dam Safety Program

## 5-3 Dam Safety

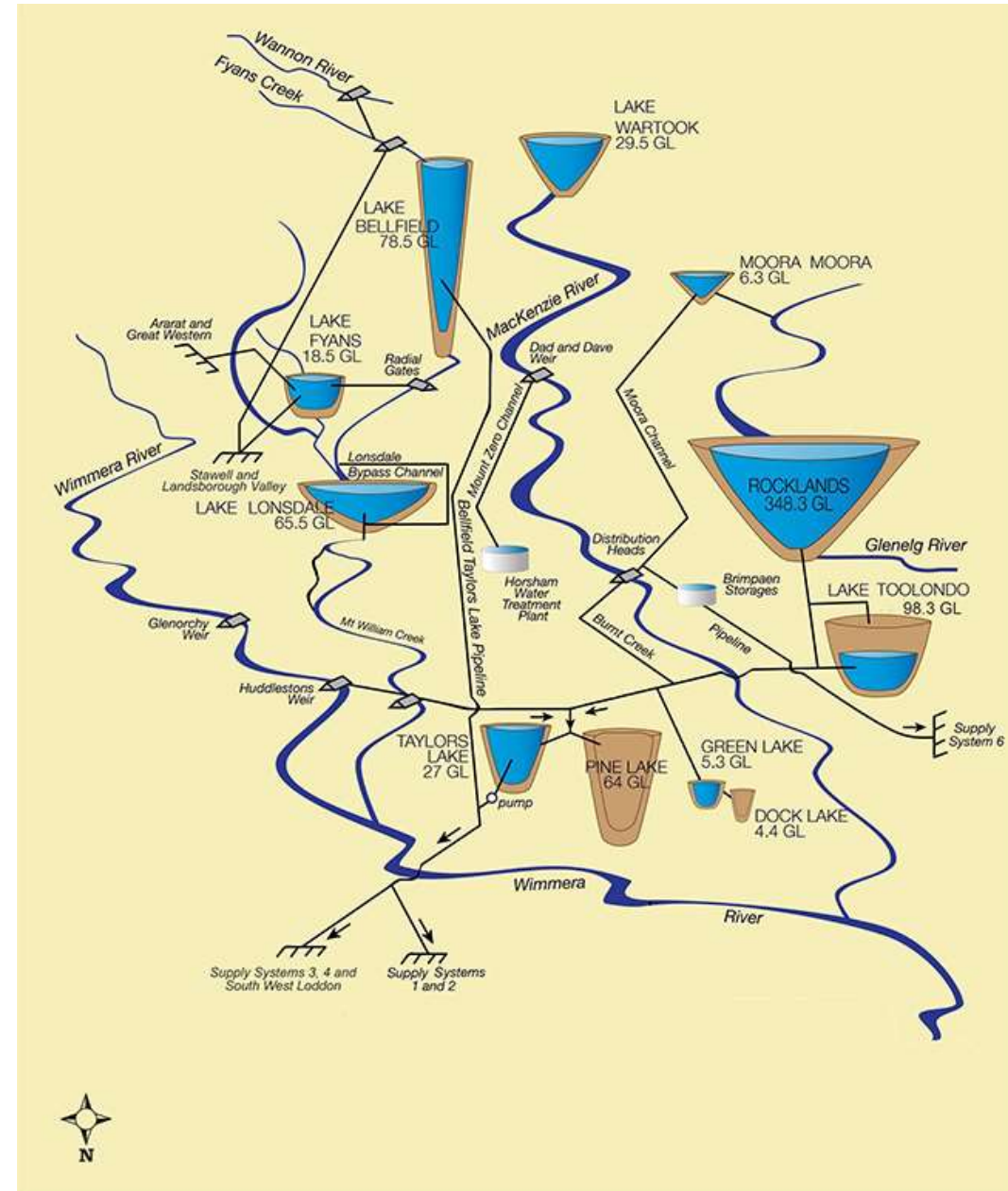
.1	The Corporation must develop and implement processes to identify, assess, manage and prioritise improvements to, and periodically review the safety of, dams, including retarding basins and wastewater storages, operated by the Corporation.  (applicable all)
.2	In developing processes under sub-clause 5-3.1, the Corporation must have regard to the ANCOLD Guidelines and have particular regard to: <ul style="list-style-type: none"> <li>(a) prioritising risks posed by the Corporation's dams over all dams, components of dams and the types of failure;</li> <li>(b) giving priority to reducing risks to life above other risks;</li> <li>(c) basing the urgency of reducing the risk posed by a dam on the relativity of risks to the tolerability limits as defined in the ANCOLD Guidelines;</li> <li>(d) basing programs for reducing risk on the concept "As Low As Reasonably Practicable" as defined in the ANCOLD Guidelines; and</li> <li>(e) where feasible, progressively implementing risk reduction measures to achieve the best outcomes for the available resources.</li> </ul> (applicable all)
.3	The Corporation must develop and implement a dam safety monitoring and surveillance program for each dam operated by the Corporation, having regard to the ANCOLD Guidelines.  (applicable all)
.4	The Corporation must prepare and give to the Secretary by 30 June each year a report that contains: <ul style="list-style-type: none"> <li>(a) a prioritised list of proposed dam safety works identified under sub-clause 5-3.1 and the dates by which the Corporation proposes to complete each of those <u>works</u>;</li> <li>(b) a summary of the risk profile of: <ul style="list-style-type: none"> <li>(i) dams operated by the Corporation at the date of the report; and</li> <li>(ii) each dam on which the Corporation proposes to undertake safety works, after those works are complete; and</li> </ul> </li> <li>(c) a summary of the overall risk reduction profile of the Corporation's dams.</li> </ul> (applicable all)

# Lake Lonsdale



# Function

- Environmental flows
- Consumptive use, in wet years
- Highly valued in the community for recreational amenity



# What's the problem?

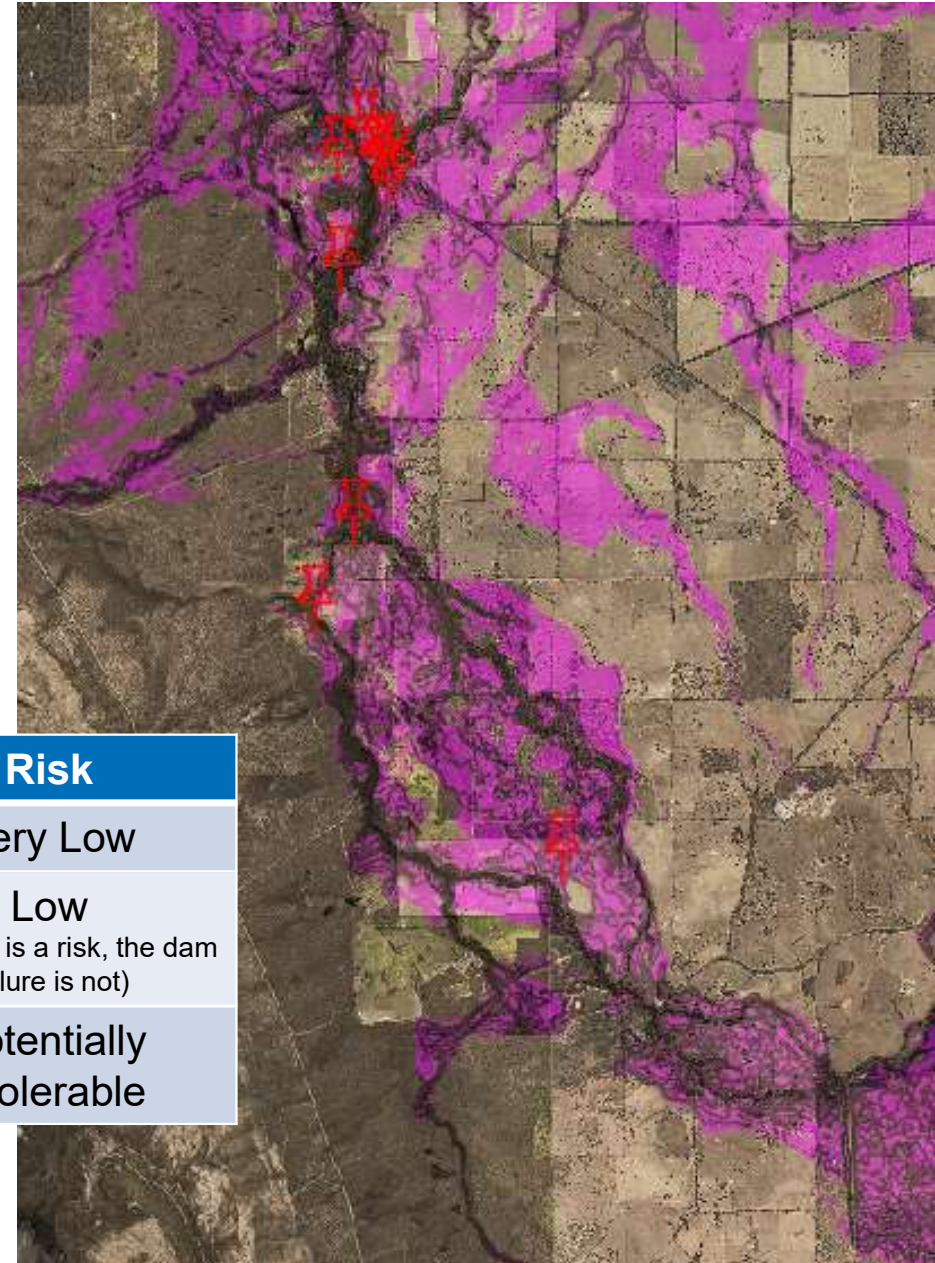
- Constructed in 1903, raised 1931
- Sandy foundation – **Past piping events**
- Clay core – **Risk of piping through embankment**
- Silty sand fill, partial sand filter – **Signs of internal erosion occurring, might self-arrest**
- Rock beaching
- Concrete outlet and wing wall – **Risk of piping**
- Concrete Lined spillway – **Actively piping**
- Spillway above maximum operating level – **A full dam puts potentially unsafe pressure on these defects**





# What's the risk?

- Up to 97 people, 10-23 homes businesses, multiple sheds & livestock
  - Mostly wet feet
  - Some potentially hazardous
- Loss of Life unlikely (PLL 0.1-1)
- Loss of dam amenity and recreation



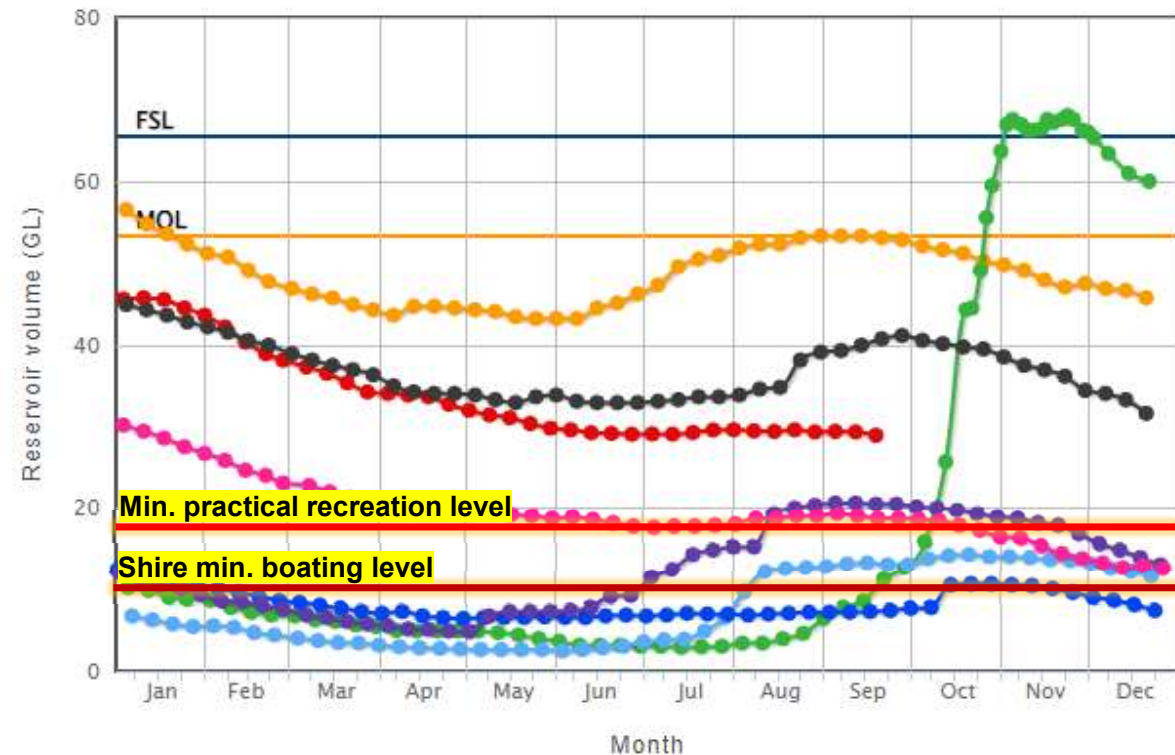
Scenario	Likelihood	Consequence	Risk
Below MOL	Low	Low	Very Low
Above MOL during flood	Possible	Low	Low (the flood is a risk, the dam failure is not)
Above MOL "sunny day"	Possible	Unconfirmed	Potentially intolerable

# Options

- Repair the dam ~ \$1.2M
  - Lowers spillway to current maximum operating level
  - Less potential for flood attenuation; marginal increase in passing floods
  - Less water (even during wet years) for recreation use

OR

- Upgrade the dam ~\$13.1M
  - Option to increase operating level
  - Retains potential for flood attenuation; marginal decrease in passing floods.
  - More water for recreation use (during wet years)



# Questions



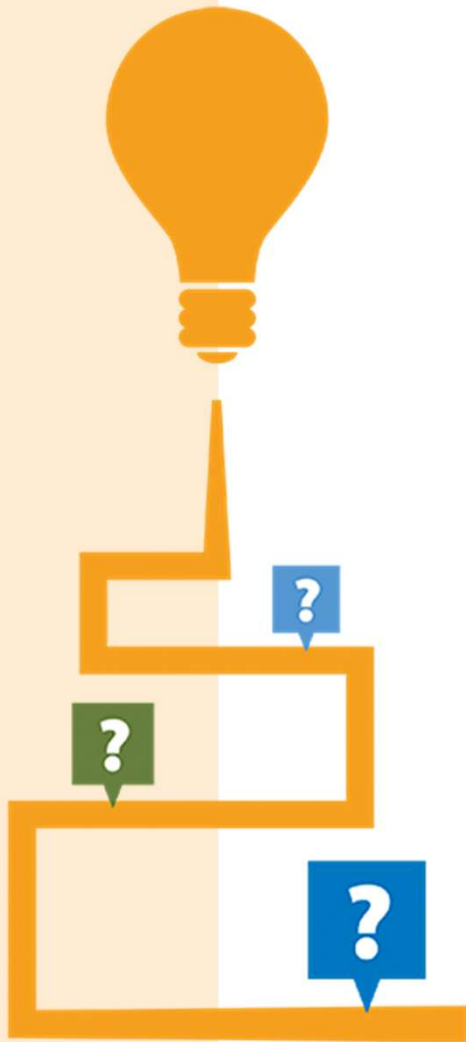
**GWM**Water

 1300 659 961

 [gwmwater.org.au](http://gwmwater.org.au)

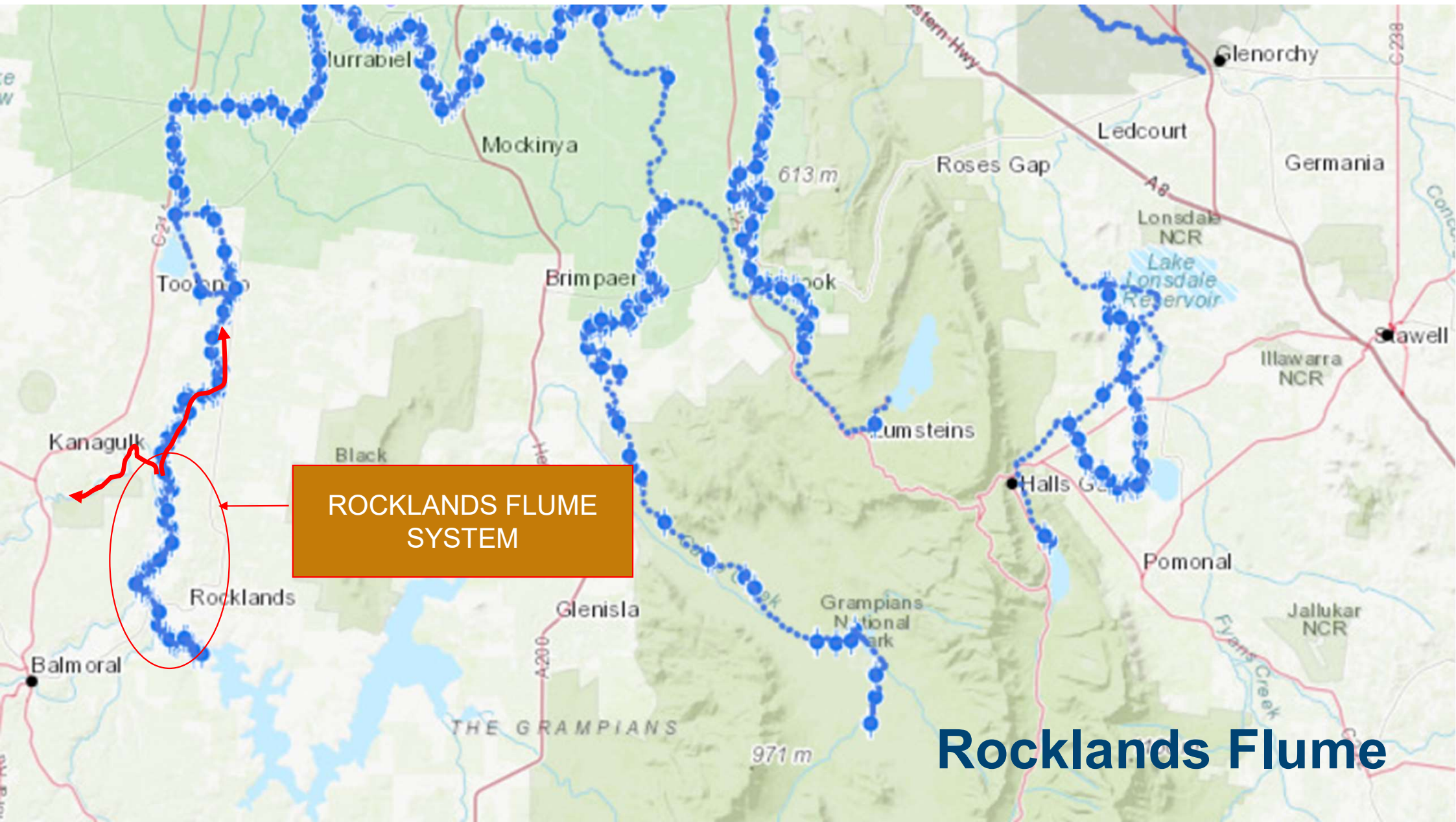
 [info@gwmwater.org.au](mailto:info@gwmwater.org.au)

 11 McLachlan Street,  
Horsham 3400



## Questions to the Stakeholder Forum

- Which option provides the most benefit to our customers and community?
  - Repair the dam ~ \$1.2M
  - Upgrade the dam ~\$13.1M



# Rocklands Flume

# Function

- Environmental flows
  - Glenelg Catchment
  - Wimmera Catchment
- GWM Water flows
  - Transfers to Toolondo (Occasional)
  - Transfers to Taylors (possible)
- Mining Interests



## What's the problem?

- Flume 5 is Failing
- Flume 1 and 2 not far behind
- Repairable for now
- Long lead time for replacement



# What's the risk?

- Disrupting operations & environmental flows
- Costly reactive repairs
- Possible large failures flooding down the hill side & damaging the environment





# Options

- Renewal ~\$9M to \$12M
- Pricing Submission
  - ~\$6M for Flume 5&1
- Wider context and opportunities



Coliban Main Channel Renewal Project – Credit: Coliban Water.

# Funding Arrangements



# Sustaining Services

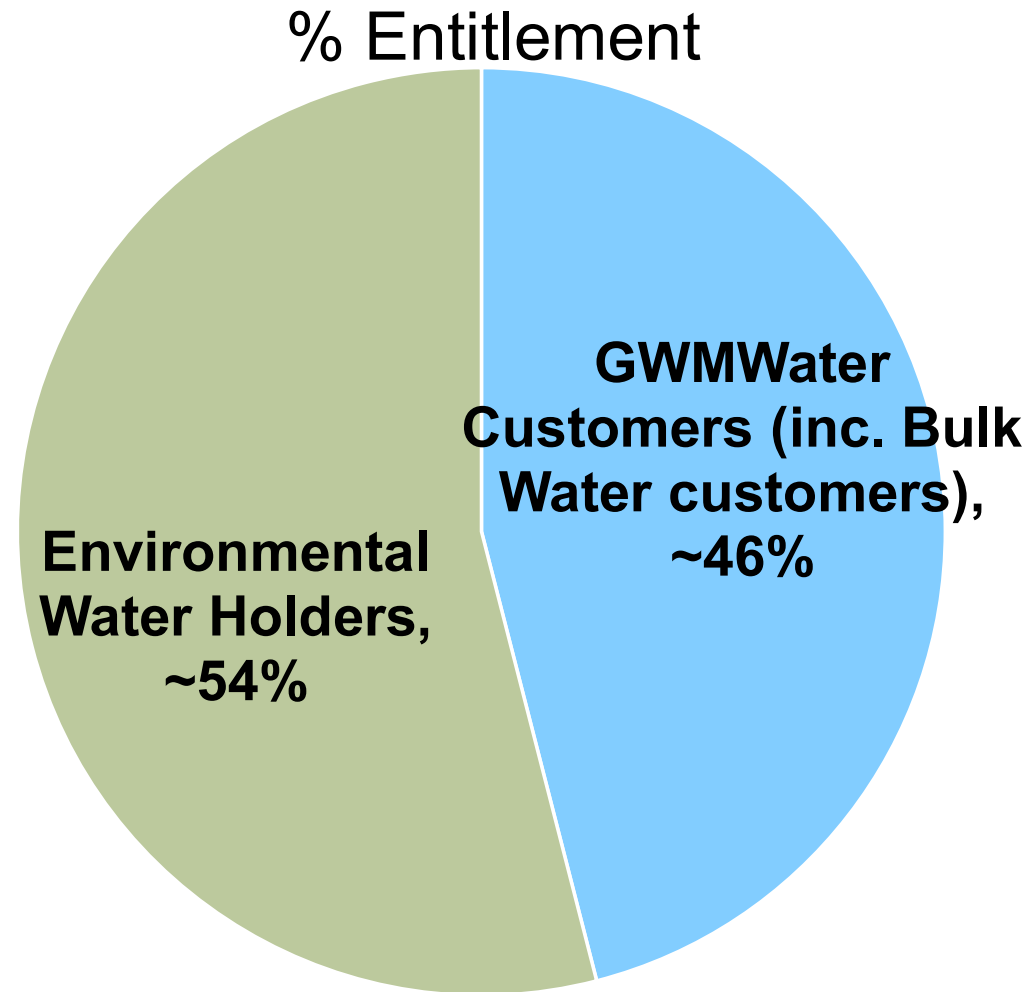
- \$877M of headworks infrastructure

Sustained by:

- ~\$8M/year in operations, maintenance & administration
- \$12.6M capital works forecast over the pricing period

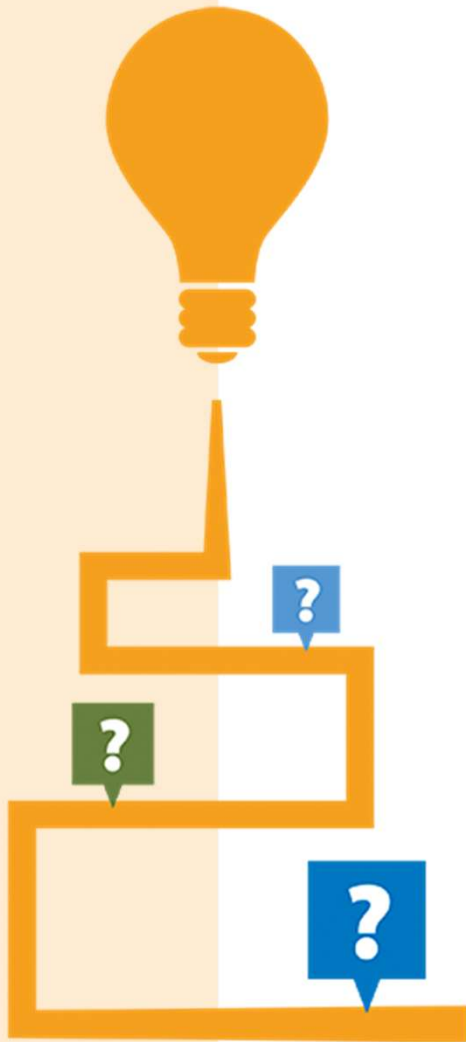


# Headworks Service



# Questions to the Stakeholder Forum

- What principles should govern funding arrangements for headworks services?



# Questions



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# Dam Safety Management System

- Inspections
- Assessments
- Monitoring
- Operations & Maintenance
- Dam Safety Emergency Plans
- Upgrades & Renewals



## Option 3: Pump From Glenelg River

- Run water through river, pump out closer to Toolondo
- Potentially lower infrastructure intensive solution with environmental benefit
- High losses due to 'swamps' mean not preferred by GWMWater or CMA



Significantly shorter alignment

High losses in 'swampy' river



## Option 2: Pump From Rocklands



- Reduces pipe diameter, and potentially cost
- Pipes whole alignment to end of flume 5, reducing water losses and avoiding future renewal costs
- Unlikely to avoid future need for a pump station at Flume 5
- Much larger up-front investment and net present cost, unjustified by present needs

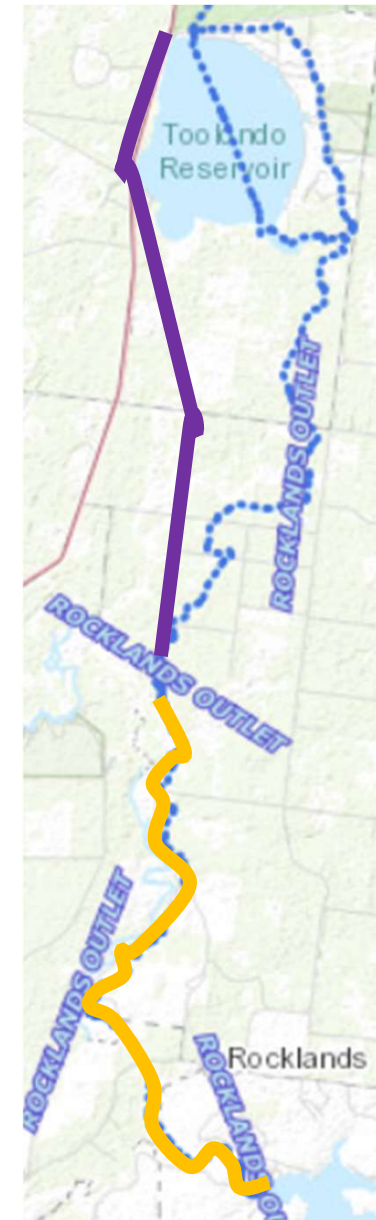
Option	Estimated Cost (250ML/day capacity)	Estimated Asset Life	Potential Water Saving (ML/year)
<b>Option 2: Pump Station at Rocklands, Pressure Pipe</b>	\$90.0M (delivery of the entire alignment; Rocklands to end of Flume 5)	80 years	800

# Water Saving Considerations

- Line to prevent exfiltration
- Pipe to prevent exfiltration and evaporation

Reach	Option	Estimated Cost	Estimated Asset Life	Indicative Water Saving (ML/year)
2: End of Flume 5 to Toolondo	Pipe	\$98.1M	80 years	1200
1: Rocklands to end of Flume 5	Line	\$24.4M	50 years	400
	Pipe	\$90.0M	80 years	800

AECOM Concept Design: [R2018-6261](#)



# Questions



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