



## CHAPTER 18

### PREFERRED OPTION FOR FURTHER DEVELOPMENT

Nullinga Dam and Other Options Preliminary Business Case



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## 18 PREFERRED OPTION FOR FURTHER DEVELOPMENT

### CHAPTER SUMMARY AND CONCLUSIONS

- Option 2: Improve MDWSS rules and operation and Option 3: Modernise MDWSS and convert losses are the preferred options for further evaluation.
- Option 4: Nullinga Dam for agricultural use is not recommended to proceed to a detailed business case at this time.
- Key success factors for Option 2 are:
  - Modelling showing that the implementation of rule and operational changes will make a difference to water availability for irrigators in the MDWSS
  - Appetite of government and SunWater to implement improvements and reforms to scheme rules and operation
  - Change in water use practices by irrigators in response to the improvements, and associated increase in agricultural production
  - Considering potential changes in local management of the MDWSS distribution infrastructure that may affect the operation of the scheme.
- Key success factors for Option 3 are:
  - Deliverability and cost of the infrastructure improvements to the distribution infrastructure
  - Ability for SunWater to convert a suitable yield of loss allocations to new water allocations for sale
  - Purchase of the new water allocations by irrigators within a suitable timeframe and associated increase in agricultural production
  - Limited negative impacts on the existing scheme and owners of existing allocations from the implementation of the option.

### 18.1 Purpose

This chapter outlines the assessment of the shortlisted options to identify the preferred option(s) to proceed to further evaluation.

### 18.2 Approach

The analysis of the four shortlisted options undertaken in the preceding chapters of this PBC was considered alongside the Building Queensland Prioritisation Framework categories, which are used for the purpose of prioritising projects across government. The Building Queensland Prioritisation Framework criteria of strategic, economic and financial, social and environmental and deliverability were weighted equally in the assessment.

### 18.3 Selection of Preferred Options

Table 1 outlines the outputs of the multi-criteria assessment for the selection of the preferred options.



Table 1 Multi-Criteria Analysis of Shortlisted Options

CRITERIA	OPTION 1: DO MINIMUM (BASE CASE)	OPTION 2: IMPROVE MDWSS RULES AND OPERATION	OPTION 3: MODERNISE MDWSS AND CONVERT LOSSES	OPTION 4: NULLINGA DAM FOR AGRICULTURE
<b>STRATEGIC</b>				
Alignment to government objectives	Low	Medium	Medium	Medium
Effectiveness in addressing the service need	Low	High	High	Medium
Market considerations	Medium	High	High	Medium
<b>ECONOMIC AND FINANCIAL</b>				
Estimated new medium priority water available (ML)	-	4,330 (additional use)	8,300 – 15,000 (new allocations)	55,400 (new allocations)
Estimated capital costs (2017\$M)	1.6	N/A	30 – 51	323 – 358
Estimated operational costs per annum (2017\$M)	6.1	1.0	0.56 – 0.75	2.8 – 5.4
Economic Net Present Value – Central Case (\$M)	-	31	73	6
Benefit Cost Ratio – Central Case	-	11.0	2.8	1.0
Economic Net Present Value – Upper Bound Sensitivity Analysis (\$M)	-	4	-9.0	-163
Benefit Cost Ratio – Upper Bound Sensitivity Analysis	-	1.8	0.8	0.4
<b>SOCIAL AND ENVIRONMENTAL</b>				
Social impacts	N/A	Positive (Medium) Negative (Low)	Positive (Medium) Negative (Medium)	Positive (High) Negative (High)
Environmental impacts	N/A	Negative (Low)	Negative (Medium)	Negative (High)
<b>DELIVERABILITY</b>				
Risk	Low	Medium	Medium	High
Potential for Value for Money from Public Private Partnership	N/A	N/A	N/A	No
	4	1	2	3

### 18.3.1 Conclusion

Option 2 and Option 3 are the preferred options to progress to further evaluation.



## 18.4 Impacts of Preferred Options

### 18.4.1 Strategic Impact

#### 18.4.1.1 Options 2 and 3

Option 2 and Option 3 will contribute to the strategic objectives of the following government plans and policies:

- State Infrastructure Plan
  - Option 2 is consistent with increasing preference towards reform options rather than build new options
  - Option 3 is consistent with increasing preference towards better use and improvement of existing infrastructure options rather than build new options.
- Far North Queensland Regional Water Supply Strategy – Option 2 and 3 align with the findings of the Strategy that the future water supply shortfall for agriculture in the region may be met by efficiency improvement in the MDWSS.
- Queensland Agricultural Land Audit – Options 2 and 3 recognises the findings of the Audit that the MDWSS is strength of the region, with significant areas of land suitable for irrigated agriculture.
- Advancing North Queensland – Option 2 and 3 aligns with the priority area of water security by providing an option to address MDWSS irrigator’s current concerns with water security.
- National Water Infrastructure Development Fund – Option 3 aligns with the objective of the feasibility component of the fund to undertake the detailed planning necessary to inform water infrastructure investment decisions and stimulate regional economic benefits.

### 18.4.2 Economic Impact

Table 2 outlines the key indicators of the economic impacts of Options 2 and 3.

**Table 2 Economic Impacts of Option 2 and 3**

ITEM	OPTION 2	OPTION 3
Economic Net Present Value—Central Case (\$M)	31	73
Benefit Cost Ratio—Central Case	11.0	2.8
Economic Net Present Value—Upper Bound Sensitivity Analysis (\$M)	4	-9.0
Benefit Cost Ratio—Upper Bound Sensitivity Analysis	1.8	0.8

### 18.4.3 Social and Environmental Impacts

#### 18.4.4 Social

##### 18.4.4.1 Option 2

Option 2 was identified to have two low beneficial social opportunity impacts, three medium beneficial social opportunity impacts and two high beneficial social impact opportunities.

The key beneficial impacts generally relate to additional employment and regional growth.



Option 2 was identified to have six low detrimental social impacts, one medium detrimental social impact and zero high detrimental social impacts identified. The key detrimental impacts relate to changes to existing business practices and processes.

#### 18.4.4.2 Option 3

Option 3 was identified to have three low beneficial social opportunity impacts, three medium beneficial social opportunity impacts and two high beneficial social impact opportunities. The key beneficial impacts centre on:

- additional employment via scheme construction activities and enhanced agricultural production
- regional growth via improved use of existing water resources, changes in land use to higher value crops and enhanced confidence to invest in long term business operations.

Option 3 was identified to have one low detrimental social impact, eleven medium detrimental social impacts and four high detrimental social impacts identified. The key detrimental impacts centre on:

- social impacts from competition for additional water allocations
- potential divisive local issue of foreign ownership
- changes to existing flow regimes via changes in infrastructure
- potential impacts on the Mareeba wetlands and associated tourism and cultural values.

#### 18.4.5 Environmental Impact

The key environmental issues associated with Option 2 relate to the potential for the increased operational performance of the scheme to result in a (marginal) expansion of land under irrigation. The key environmental impacts for Option 3 relate to the potential for the creation of new water allocations and the associated expansion of land under irrigation.

Environmental issues associated with expansion of land under irrigation include:

- Changes to surface water and groundwater level and quality due to increases in farm inputs, such as pesticides and fertilisers. The water quality in the Barron Basin already exceeds aquatic ecosystem guidelines for protection of freshwater systems.
- Clearing of vegetation to facilitate new irrigation areas. Land surrounding the existing irrigation area is mapped as regulated vegetation and has the potential to contain threatened ecological communities. Clearing in these areas could trigger relevant approvals.

#### 18.4.6 Financial and Commercial Impact

Table 3 outlines the key financial impacts of Options 2 and 3.

**Table 3 Financial Impacts of Option 2 and 3**

ITEM	OPTION 2	OPTION 3
Estimated capital costs (2017\$M)	N/A	30 – 51
Estimated operational costs (2017\$M)	1.0	0.56 – 0.75
Revenues – One off price for sale of water allocation (2017\$ per ML, medium priority)	N/A	3,058 – 3,579*

\*The shortfall percentage is based on recoverable capital costs from customers with a benchmark purchase price of \$2,500 per ML for new water allocations, consistent with the average current trading price for water allocations in the MDWSS. This percentage is for illustrative purposes and based on straight recovery of capital costs only. It does



not take account of the take-up profile of new water allocations. Movements in the forecast demand for new water allocations will have implications for estimates of the capital costs shortfall.

### 18.4.7 Procurement Approach

#### 18.4.7.1 Option 2

Option 2 will be implemented by the DNRM and SunWater. The procurement approach for any external advice to implement the reforms will be developed by DNRM and SunWater.

#### 18.4.7.2 Option 3

Option 3 is intended to be delivered by SunWater as a number of smaller projects. The procurement approach will be developed by SunWater and all procurement will be completed in accordance with SunWater procurement policies and framework.

### 18.5 Timeframe

#### 18.5.1 Option 2

Option 2 will be implemented by DNRM and SunWater, as the responsible entities for the relevant water instruments, subject to resourcing and budgetary constraints within those organisations. It is expected that the timeframe to implement Option 2 would be approximately two years. However, that timeframe will be dependent upon funding and resourcing decisions made in those organisations.

#### 18.5.2 Option 3

In March 2017, the Queensland Government and SunWater submitted an Expression of Interest application to the NWIDF seeking a capital contribution towards several of the sub-projects in Option 3 to modernise the existing MDWSS distribution system. If the NWIDF funding application is successful, timeframes for implementation will be developed in accordance with the fund requirements. If the NWIDF funding application is not successful, the timeframe for implementation will be dependent on outcome of further evaluation and further funding and resourcing decisions made by SunWater.

### 18.6 Criteria for Success

#### 18.6.1 Option 2

The realisation of the benefits from implementation of Option 2 is dependent on several key factors, outlined in Table 4. These factors will be used to determine the success of the option to meet the service need.

Table 4 Option 2—Criteria for Success

CRITERIA	MEASURE	RISKS
Modelling showing that the implementation of rule and operational changes will make a difference to water availability for irrigators in the MDWSS	Modelling shows predicted benefits	Modelling does not show any difference negating benefits from reforms
Ability of government and SunWater to implement improvements and reforms to scheme rules and operation	Change to rules and operation are made within suitable timeframe	Appetite from government and SunWater to implement reforms



CRITERIA	MEASURE	RISKS
Change in water use practices by irrigators in response to the improvements	Increase in water utilisation and agricultural production	Changes to rules and operation do not result in change in behaviour, benefits not realised
Transition to local management of MDWSS distribution infrastructure (if made) does not impact on the effectiveness of reforms	Acceptance of the rule and operational changes by the local management entity	Local management entity does not accept changes to bulk supply rules and operation

### 18.6.2 Option 3

Similarly, the realisation of benefits from the implementation of Option 3 is dependent on several key factors outlined in Table 5. These factors will be used to determine the success of the option to meet the service need.

Table 5 Option 3—Criteria for Success

CRITERIA	MEASURE	RISKS
Deliverability and cost of the infrastructure improvements to the distribution infrastructure	Infrastructure works being delivered within cost estimates	Works exceed cost estimates and financial exposure to meet shortfall in funding
Ability for SunWater to convert a suitable yield of loss allocations to new water allocations for sale	Infrastructure improvements deliver the estimated loss savings	Water savings are lower than estimated and return on investment is lower because less achieved from the sale of the water allocations
Purchase of the new water allocations by irrigators within a suitable timeframe and associated increase in agricultural production	Estimated take up of water allocations is met Ongoing usage of new water allocations is consistent with estimated utilisation rates	Financial risk as return does not meet capital expenditure Economic risk as benefits from increase in agricultural production not realised
Limited negative impacts on the existing scheme and owners of existing allocations	Level of agricultural production in region remains consistent, particularly in area affected by the works Customer complaints	Delivery of infrastructure works impact on existing business operations impact on level of agricultural production in region

## 18.7 Priority

### 18.7.1 Option 2

The prioritisation of Option 2 is considered to be a matter for DNRM and SunWater, as the responsible entities for the water instruments.

### 18.7.2 Option 3

The prioritisation of Option 3 is considered a matter for SunWater, as the current owner and operator of the MDWSS.