CHAPTER 2

PROPOSAL BACKGROUND

Nullinga Dam and Other Options Preliminary Business Case

CONTENTS

FIGURES

2 PROPOSAL BACKGROUND

CHAPTER SUMMARY AND CONCLUSIONS

- Nullinga Dam has a long history, first being proposed in the 1950s as part of the investigations for the Mareeba-Dimbulah Irrigation Area (MDIA) for tobacco production.
- Over the past 10 years, Nullinga Dam has been mentioned as a long-term initiative in many reviews and studies of bulk water supply for Far North Queensland. These have indicated a potential for Nullinga Dam to service the future water supply needs of Cairns (including potential demand from the proposed Aquis Resort) and stimulate additional irrigated agriculture in the region.
- In the 2015 state election, the Queensland Government made an election commitment that Building Queensland would consider Nullinga Dam in recognition of the need for additional water storage for urban and agricultural expansion in the Tropical North.
- In July 2015, the Australian Government made a commitment to provide up to $5 million for a detailed study of the economic feasibility of Nullinga Dam. This funding was secured from the National Water Infrastructure Development Fund (NWIDF) in August 2016.
- It is not possible for Cairns to efficiently receive water from the proposed Nullinga Dam. Tinaroo Falls Dam and Nullinga Dam would need to operate in conjunction, with Cairns receiving water via releases from Tinaroo Falls Dam down the Barron River for extraction at Cairns. This process would require a 'swap' or 'substitution' of existing water allocations from Tinaroo Falls Dam to water allocations from Nullinga Dam. Irrigators in the MDWSS are likely to have significant concerns with this 'swap' or 'substitution' process as water released from Nullinga Dam may have, or may be perceived to have, different characteristics to water from Tinaroo Falls Dam in relation to price, quality and reliability.
- The potential for Nullinga Dam as a bulk water supply option for Cairns is therefore considered to have significant complexities.
- The MDWSS is the major water resource development in the region and provides water to about 25,000 hectares of irrigated agriculture. Water allocations in the MDWSS are currently fully allocated. Alternative options will need to be evaluated to allow for a potential expansion of irrigated agriculture within the area and surrounding region. The annual level of water use in the MDWSS is inversely related to the amount of rainfall. Historically, the level of utilisation (water use as a percentage of entitlements) is generally 60 to 70 per cent, but has been trending upwards to meet scheme capacity. Dry conditions have persisted since 2012–13 and as a result the level of utilisation in 2015-16 was about 86 per cent.
- The MDWSS is a highly developed irrigation area and has sophisticated irrigators with a history of excellence in large scale agricultural production and innovation. There are approximately 40 major crops grown underpinned by supplemented water supply. In terms of water use, sugarcane is the dominant crop in MDWSS. In terms of production value, perennial tree crops (avocados, bananas and mangoes) and horticulture are the dominant crops in the region.
- There is potential for Nullinga Dam to service additional irrigated agriculture in the region, subject to market appetite.

2.1 Nullinga Dam

The proposed Nullinga Dam site is located on the Walsh River, approximately 55 kilometres south-west of Cairns and 24 kilometres south-south-west of Mareeba. It is situated within the Mareeba Shire Council area and sub-catchments E and F of the Barron Water Plan.

Nullinga Dam was first proposed in the 1950s as part of the original investigations for the development of the MDIA to support tobacco production. However, a decision was made to construct Tinaroo Falls Dam in favour of Nullinga Dam, as it could supply significantly more water to a greater area.

Figure 1 shows the Nullinga Dam proposed site (in the lower middle section of figure), effectively at the Southern border of the MDWSS. Nullinga Dam could provide supplemented water to the Walsh River and Western MDWSS distribution area, as the water from Nullinga would naturally flow west from this section of the scheme.

2.2 Nullinga Dam Potential

Over the past 10 years, Nullinga Dam has been mentioned as a long-term initiative in many reviews and studies of bulk water supply for Far North Queensland. These include the Program of Works, State-wide Water Grid (2007) and the Draft and Final Far North Queensland Regional Water Supply Strategy (2007 and 2010).

These reports and studies have indicated a potential for Nullinga Dam to:

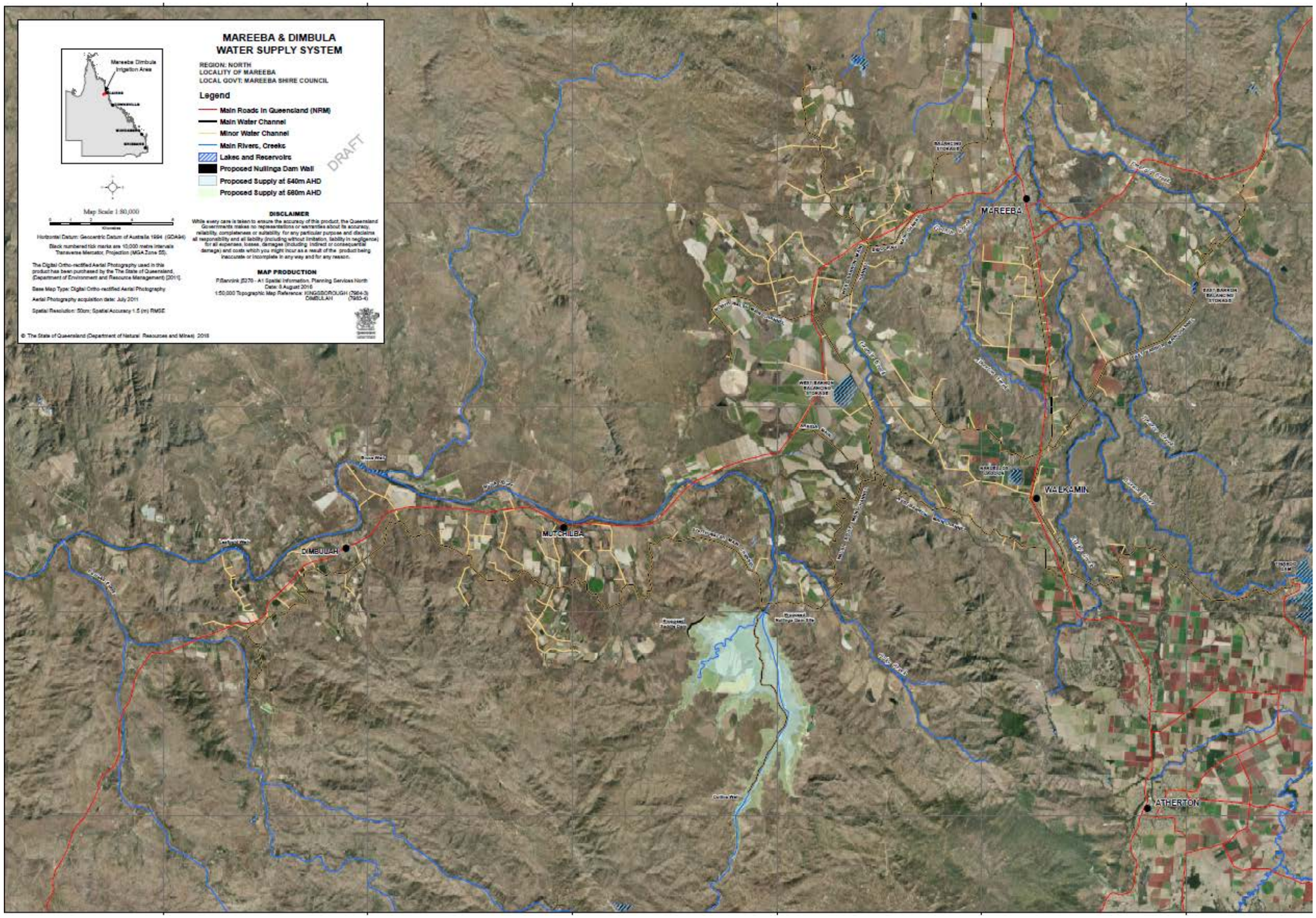
- service the future water supply needs of the Cairns urban community (including potential demand from the proposed Aquis Great Barrier Reef Resort [Aquis], if it proceeds)
- stimulate additional irrigated agriculture in the region. Irrigated agriculture in the Atherton Tableland is a mature sector, so any development would see an expansion of that production base.

2.3 State Government Election Commitment

During the 2015 state election, the Queensland Government made an election commitment to ‘submit an assessment of the Nullinga Dam to Building Queensland for priority consideration in recognition of the need for additional water storage for urban and agricultural expansion in the Tropical North’.

Queensland Treasury Corporation subsequently undertook a high-level analysis of the proposed Nullinga Dam for DEWS, which was provided to Building Queensland for consideration. This high-level analysis has been considered by Building Queensland in the development of the PBC.

Figure 1 Mareeba-Dimbulah Water Supply Scheme and Nullinga Dam Location



Source: DNRM

2.4 Developing Northern Australian White Paper and National Water Infrastructure Development Fund

In July 2015, the Australian Government released the Developing Northern Australia White Paper.

A key component of the White Paper was the establishment of the NWIDF. The objectives of the NWIDF are to undertake detailed economic planning to inform water infrastructure investment decisions, and expedite the construction of water infrastructure.

The White Paper committed up to $5 million from the NWIDF towards 'a detailed examination of the economic feasibility of Nullinga Dam'. To implement this commitment, Building Queensland and the Australian Government Department of Agriculture and Water Resources agreed a project plan for a staged examination of Nullinga Dam. The National Project Agreement bilateral schedule securing the NWIDF funding was signed by the respective Ministers of the Australian Government and Queensland Government in August 2016.

This PBC is Stage 1 and will investigate the potential for Nullinga Dam and other options to address the identified future water supply shortfall in the region. Subject to the outcomes of the PBC and Queensland Government approval to proceed, Stage 2 will involve a Detailed Business Case.

2.5 Nullinga Dam as a Water Supply to Cairns

In 2015, CRC Cairns Regional Council adopted the Cairns Water Security Strategy which outlined a preferred strategy for implementing a series of short, medium and long-term options to meet water demand in Cairns over the next 30 years.

All the long-term options in the Cairns Water Security Strategy were stated as subject to further investigation. However, the preferred sequence for the long-term options was listed as first, conversion of MDWSS losses and second, a regional dam, nominally Nullinga Dam.

It is not possible for Cairns to efficiently receive water from the proposed Nullinga Dam due to the locations of Cairns and the Nullinga Dam site. Rather, to supply Cairns with water from the Atherton Tableland area, Tinaroo Falls Dam and Nullinga Dam would need to operate in conjunction, and Cairns would need to receive water via additional releases from Tinaroo Falls Dam down the Barron River for extraction at Cairns.

As the allocations from Tinaroo Falls Dam within the MDWSS are fully allocated, the supply to Cairns from Tinaroo Falls Dam would require a two-step process:

1. Existing water allocation holders from Tinaroo Falls Dam would need to **voluntarily** 'swap' their existing water allocations from Tinaroo Falls Dam in exchange/'substitution' for newly purchased water allocations from Nullinga Dam.
2. The 'freed up' allocations in Tinaroo Falls Dam created by this process would need to be purchased by Cairns Regional Council for water supply to Cairns, and the council would need to put in place appropriate extraction and water treatment infrastructure to access these water allocations from the Barron River and distribute the water within its reticulation network.

Irrigators in the MDWSS are likely to have significant concerns with this 'swap/substitution' process. This is because water released from Nullinga Dam may have, or may be perceived to have, the following different characteristics to water from Tinaroo Falls Dam:

- Water pricing—there would need to be a 'no-disadvantage' approach to irrigators voluntarily participating in a water allocation swap/substitution. Accordingly, Cairns Regional Council would likely

need to pay the pricing differential including capital charges, so the higher cost would most likely be allocated to the council under this option.

- Water quality—no cost-effective water quality risk mitigation (Nullinga Dam in comparison to Tinaroo Falls Dam) is available and SunWater bulk water contracts traditionally exclude water quality considerations/obligations.
- Water product reliability—the Nullinga Dam yield scenarios modelled to date are based on an assumed Integrated Quantity and Quality Model (IQQM) medium priority monthly reliability of 96 per cent, which matches the current reliability of medium priority water allocations in the MDWSS and Tinaroo Falls Dam. No water supply scheme performs or operates identically, but in theory the reliability characteristics are likely to be able to be made similar, as long as scheme operating rules (e.g. announced allocation and carry over provisions) are also equivalent.

The potential for Nullinga Dam as bulk water supply option for Cairns is therefore considered to have significant complexities.

2.6 Nullinga Dam as a Water Supply to Irrigated Agriculture

The MDWSS is the major water resource development in the Barron Water Resource Plan area and supplies water to approximately 25,000 hectares of irrigated agriculture. Water allocations in the MDWSS are currently fully allocated. Alternative options will need to be evaluated to allow for a potential expansion of irrigated agriculture within the area and surrounding region.

In terms of land area and water use, sugarcane is one of the major crops in the areas, followed by perennial horticulture and broadacre cropping. In terms of perennial horticulture, bananas, mangoes and avocados are the main crops grown in the region. Horticulture dominates the region in terms of the dollar value of production. In recent years, there has been an increase in permanent plantings of high value crops. Such crops require more water as they mature so their demand for allocation will continue to grow.

The climate in Far North Queensland is highly variable. Even within the MDWSS, the average annual rainfall ranges from 1,295 mm at Tinaroo Falls Dam, to 1,032 mm at Walkamin, and 780 mm near Dimbulah.[1] The annual level of water use in the MDWSS is inversely related to the amount of rainfall. Historically, the level of utilisation (water use as a percentage of entitlements) is mostly around 60 to 70 per cent. However, the recent dry conditions have persisted since 2012–13 and as a result the level of utilisation in 2015–16 was around 86 per cent.

The MDWSS is considered a highly developed irrigation area and has sophisticated irrigators with a history of excellence in large scale agricultural production and innovation. It supports a resilient field and tree cropping sector, livestock and dairy farming, horticulture and some timber production. The area is expected to continue to build on its reputation supported by a strong base in excess of 40 major crops underpinned by supplemented water. A range of elevation, soil types, climate and rainfall exist within and adjacent to the scheme.[2]

Is it therefore considered there is potential for the proposed Nullinga Dam to service additional irrigated agriculture in the region, subject to market appetite.

[1] Queensland Department of Agriculture and Fisheries, *Queensland Agricultural Land Audit, Far North Queensland*, May 2013, p 216.
[2] Tablelands Futures Corporation 2013 p.1, http://www.tablelandsfutures.com/wp-content/uploads/2015/04/Our-Economy-Our-Future-2013-FINAL.pdf