Cave Hill Dam Funding Models Options Analysis

North West Queensland Strategic Plan Water Sub-committee

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AECgroup

Outcome Driven

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Executive Summary

Background

AEC was commissioned by the North West Queensland Strategic Plan Water Sub-committee to conduct an investigation into investment models that may be appropriate for developing new water storage infrastructure in the Mount Isa—Cloncurry Region with a focus on "Cave Hill Dam".

Cave Hill Dam

"Cave Hill" is located some 18km south of Cloncurry. It the only site within the Cloncurry River catchment shortlisted in a CSIRO report (Petheram *et al*., 2013) as a "promising site" for a dam, one of only three in the entire Flinders River catchment.

As per the CSIRO specifications, Cave Hill Dam would be capable of storing 248GL of water. It had a projected height of spillway of 16m above the riverbed (FSL 224) and would be over 700m in length. An artistic impression of the dam is given in the figure below.

An additional saddle dam to the west, some 900m long and up to 5m high, would be required to contain flood rises in the reservoir.

The dam would generate a lake area, when the reservoir is full, of approximately 50km^2.

Figure ES1: Artist's Impression of Possible Cave Hill Dam

Source: Petheram *et al*. (2013, p.74)

Cave Hill Dam was nominated by the CSIRO as a 'preferred site' because it could supply about 40GL of water in 85% of years and about 25GL in 90% of years.

Cave Hill Dam was considered by the Joint Select Committee on Northern Australia in 2014 and put forward for further consideration on the basis that it provided a way of increasing the supply of town water to Cloncurry, thereby supporting potential development for a feed lot and abattoir, and expansion of mining and industry (JSCNA, 2014).

Petheram *et al*. (2013) also identify an area of around 12,000ha downstream along the Cloncurry River that would be suitable for irrigated land use. If this area was to grow irrigating forage sorghum, this could potentially service a 65,000 head per annum feed lot.

While some uptake potential exists from the local Cloncurry Shire businesses and residents as well as existing resource operations, "the economic viability of a Cave Hill Dam based proposal would be largely dependent on irrigated agricultural production" (Petheram *et al*. 2013, p.75).

Investment Models Considered

The following general infrastructure funding models have been identified in the literature:

- Public funding (i.e. via government debt/taxes).
- User charges.
- Producer levies.
- Private debt/equity funding.
- Public Private Partnerships (PPPs).

The first three models rely on various initial funding sources from within the public sector (Montoya, 2011). In contrast, PPPs (and purely private sector-led developments) leverage borrowing and/or equity contributions from private sources.

In additional to traditional infrastructure funding methods, a range of additional mechanisms have been identified, with varying levels of relevance to the Cave Hill Dam development, including:

- **Value Capture Levy:** A value capture levy aims to capture the uplift in land values that result from the planning process, development of land or construction of beneficial infrastructure. The levy is generally only captured when the property changes ownership and receipts are used to fund infrastructure that further supports development.
- **Co-funding:** The government provides a capital contribution, either through payment of a proportion of the total capital costs or by providing an element of the works (for example enabling works) in order to reduce the funding requirements and facilitate private sector investment.
- **Concessional/contingent loans:** Under this option, the government provides a proportion (say 50%) of the total funding requirement as a loan at a low rate of interest reflecting the government's cheaper cost of funding. Loan repayment levels can potentially be tied to the infrastructure operator's income in order to further de-risk the development.
- **Demand guarantees:** A demand guarantee supports a minimum uptake from consumers in order to support the development of the initial infrastructure. Irrigation water providers typically utilise "take or pay contracts" in order to reduce potential revenue volatility due to seasonal factors.

Stakeholder Consultations

Consultations were undertaken as part of this project with key water industry stakeholders in the Mount Isa—Cloncurry region, and external funding experts. A number of implications for Cave Hill Dam infrastructure funding were identified through the consultation process. Of significant note:

- Both public and private funding options for the infrastructure are potentially available.
- Regulatory approvals represent a substantial hurdle for private investment in terms of risk and timeframes. Ideally, approval work (in particular Environmental Impact Statement (EIS)) would be led through a State agency.
- Demand levels and capacity to pay are key considerations for both public and private funding sources:
    - Demand from existing resource operators is identified as significantly limited for existing operations, and new resource finds would need to be of a significant scale to justify a resource proponent developing Cave Hill Dam.

  - Agricultural development appears the most feasible source of uptake to support development.
  - Agricultural development can underpin additional economic development in the region, through trade and processing, resulting in additional industrial-urban water demand.
- An integrated approach to development is the best option for attracting private funding, covering both water resource development and agricultural land consolidation/release.

Suitability for Cave Hill Dam

AEC has developed a high-level framework for assessing the various identified funding options for developing and operating Cave Hill Dam. AEC has developed a framework for assessing the various identified funding options for developing and operating Cave Hill Dam. This framework is generic in nature because other than the cursory information about a potential "Cave Hill Dam" in the CSIRO report (Petheram *et al*., 2013) no other information about the infrastructure or its operation was available to support a detailed assessment.

In assessing each of the options, the following key factors were considered:

- Operational viability/risk.
- Costs to consumers.
- Costs to the public sector.
- Likelihood of attaining funding/investment.

For each of the five criteria, a qualitative rank was assigned to each potential funding option based on overall suitability for Cave Hill Dam as defined in the table below.

Table ES.1: Ranking Criteria

Rank	Definition
5	Very Highly Suitable
4	Highly Suitable
3	Suitable
2	Marginal
1	Unsuitable

Source: AEC

A summary breakdown of the criteria and rankings is provided in the table below. The full analysis is provided as Appendix A.

Table ES.2: Options Analysis Summary Outcomes

Funding Method	Overall Outcome /5	Notes
Public Funding		
General budget appropriations	4	• Significant capacity at a State level to develop Cave Hill Dam, subject to demand and financial feasibility • Strong public benefit outcomes to support a public-led development • Limited capacity identified at local level to provide significant funding
Taxation revenue		
Borrowings		
Private Funding		
Private debt/equity	3	• The potential for purely private model is dependent on a viable integrated dam and agricultural development • Scale and likelihood of commercial returns is subject to significant further feasibility assessment. However, due to the long-term nature of the infrastructure, returns are unlikely to support a purely commercial development without a level of public support/subsidy
User charges	3	• Significant capacity to utilise user charges to as a method to either fully or partly fund operations beyond initial start-up capital

Funding Method	Overall Outcome /5	Notes
		• Capacity for user charges to fully cover (whole of life) costs plus scheme operator margins appears limited
Development contributions	2	• Limited scope to apply a contributions model of a scale sufficient to contribute a significant portion of the required funding
Public Private Partnerships		
Public private partnership	4	• Potential to leverage private sector entrepreneurship and expertise combined with public regulatory/financial support • Opportunity to develop the infrastructure with a reduced burden on public finances
Alternative Funding Methods		
Specific-purpose securitised borrowing	3	• Some potential as a funding mechanism depending on the final proponent • Potentially high capital cost relative to alternative funding sources identified
Value capture levy	3	• Some scope to apply a value capture levy across new irrigated agricultural lands (assuming freehold release) • Limited capacity to significantly cover the costs of development
Specific purpose levies (SPLs)	2	• Limited base to support a SPL to develop Cave Hill Dam

Source: AEC

Outcomes

The above analysis presents three main initial funding models for developing Cave Hill Dam, each of which is considered in more detail below.

A Public Sector Led Development

This option would see the infrastructure funded primarily through State and Federal means. Dam development would be progressed alongside irrigated agricultural lands consolidation/release in order to develop a user charges revenue stream to support operations. Key strengths of this model include:

- Consideration/capture of the significant public benefit values associated with Cave Hill Dam.
- Lower costs of capital, with the potential to leverage State and Federal borrowing capacity.
- Strategic alignment with both State and Federal development objectives for agriculture and Northern Australia.

A Private Integrated Supply Chain Development

The opportunity to develop Cave Hill Dam to support broader irrigated agriculture and value adding may have significant private investment potential. However, due to the high cost of private capital and potential timing mismatch between private return requirements and long-term dam infrastructure benefits, significant public support may be required to facilitate a private sector led-development. Avenues through which public support can increase the potential for the private development of Cave Hill Dam include:

- Detailed feasibility study works, most likely focusing on an integrated investment opportunity, combining the dam infrastructure with consolidated agricultural lands made available to support an integrated agricultural supply chain.
- Determination of planning and environmental approvals, to decrease the risk and timeframes for returns on private investment.
- Co-funding and/or concessional loans to decrease the up-front development costs and lower the cost of private capital to a level more suitable for long-term infrastructure funding.

In return for initial support, concessions and regulations may be negotiated to ensure fair pricing and supply availability for the surrounding community to capture the full development and water security benefits of the Cave Hill Dam project.

Public Private Partnership

A properly structured PPP is a strong fit for the Cave Hill Dam development, due to:

- The significant private business opportunities generated by the development. A PPP would best leverage both the commercial and public benefit aspects of the project.
- Potential to extract long-term value-for-money through an appropriate risk transfer to the private sector over the life of the project (from design/construction to operations/maintenance).
- Potential to leverage the public sector's lower borrowing costs in order to facilitate private sector risk taking and entrepreneurship to support a key regional development.

Potentially viable PPP models include a design build operate, build own operate, build own operate transfer or lease own, operate.

Summary

This study has identified a range of potential investment models to support the development of Cave Hill Dam. Consultation with regional and investment stakeholders has uncovered a number of potentially viable funding models and sources worthy of further consideration and investigation.

Despite the significant economic and public benefit potential of the project, it is likely that either a public or private proponent would face substantial risks in developing the initial dam and distribution infrastructure. Uptake from the current resources sector has been identified as modest, with development viability largely dependent on associated irrigated agricultural production in the absence of a significant new resource development being established in the surrounding area.

A number of preliminary steps should be taken in order to minimise this risk, in order to maximise the potential for successfully developing Cave Hill Dam, including:

- Initial feasibility work and business case.
- Establishing planning and environmental approvals to support the development of a suitable Expression of Interest (EOI), potentially within a PPP framework.

Furthermore, an appropriate financial contribution at the State and/or Federal level has the potential to substantially increase the financial viability of developing the up-front infrastructure. Given current strategic interest in increasing agricultural production, Cave Hill Dam presents a suitable project to receive significant support on a number of grounds:

- Potential to improve the viability and productivity of strategic agricultural lands.
- Potential to increase Australia and Queensland's agricultural production.
- Substantial employment and regional economic development outcomes during construction and once operational.

Concessional financing through the $5 billion developing Northern Australia Fund and co-funding through the National Water Infrastructure Development Fund are two key avenues through which the public sector can support the development of Cave Hill Dam.

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1. Introduction

1.1 Background

Alluvium (2016) recently conducted a desktop analysis of water supply and demand in the region and consolidated the data into a multi-criteria decision analysis (MCDA) framework. The report assessed nine water infrastructure projects on the basis of technical, geo-hydrological, social, economic and environmental considerations and risk. The report identified Cave Hill Dam as the most promising option to provide supply and security of water for the region.

The key reasons for the choice of "Cave Hill" over other potential dam sites included its superior water storage capacity and its locality in the Cloncurry River catchment. The reasons specifically were:

- New water storage on the Cloncurry River provided for increased resilience in the regional water supply compared to adding storage capacity on the Leichhardt River which already had two storages. Current and anticipated future water demand by industry and the community in the Mount Isa precinct can be met by existing storages with high confidence and, if required, additional existing (small) storages could be connected.
- Compared to other potential dam locations on the Cloncurry River, Cave Hill offered the largest storage capacity, was closest to Cloncurry and, therefore, easiest to access, and had previously been deemed the most promising location (Petheram, *et al*., 2013). It was deemed best to facilitate the development of irrigated pasture and agriculture on land, as well as support tourism, and generate economic multipliers in Cloncurry in the process.

1.2 Purpose of this Report

AEC was commissioned by the North West Queensland Strategic Plan Water Sub-committee to conduct an investigation into investment models appropriate for developing new water storage infrastructure in the Mount Isa—Cloncurry Region with a focus on "Cave Hill Dam".

The question addressed by this report is how the realisation of Cave Hill Dam could be funded.

It is important to note that this investigation of funding models is generic in nature because other than the cursory information about a potential "Cave Hill Dam" in the CSIRO report (Petheram *et al.*, 2013) no other information about the infrastructure or its operation was available to support a detailed assessment. Typically, a detailed investigation of funding models forms part of a full feasibility study.

1.3 Structure of this Report

The remainder of this report is structured as follows:

- Chapter two provides an overview of the proposed Cave Hill Dam development.
- Chapter three provides a review of the potential funding models available to realise the development.
- Chapter four provides an overview of the outcomes of stakeholder consultations undertaken for this study.
- Chapter five presents an analysis of the potential suitability of identified funding models to support the Cave Hill dam development.
- Chapter six provides a high-level action plan, highlighting the steps needed in order to secure funding for the development.

2. Cave Hill Dam Overview

"Cave Hill" is located some 18km south of Cloncurry. It the only site within the Cloncurry River catchment shortlisted in a CSIRO report (Petheram *et al*., 2013) as a "promising site" for a dam, one of only three in the entire Flinders River catchment.

Cave Hill Dam would be capable of storing 248GL of water. It had a projected height of spillway of 16m above the riverbed (FSL 224) and would be over 700m in length. An artistic impression of the dam is given in the figure below.

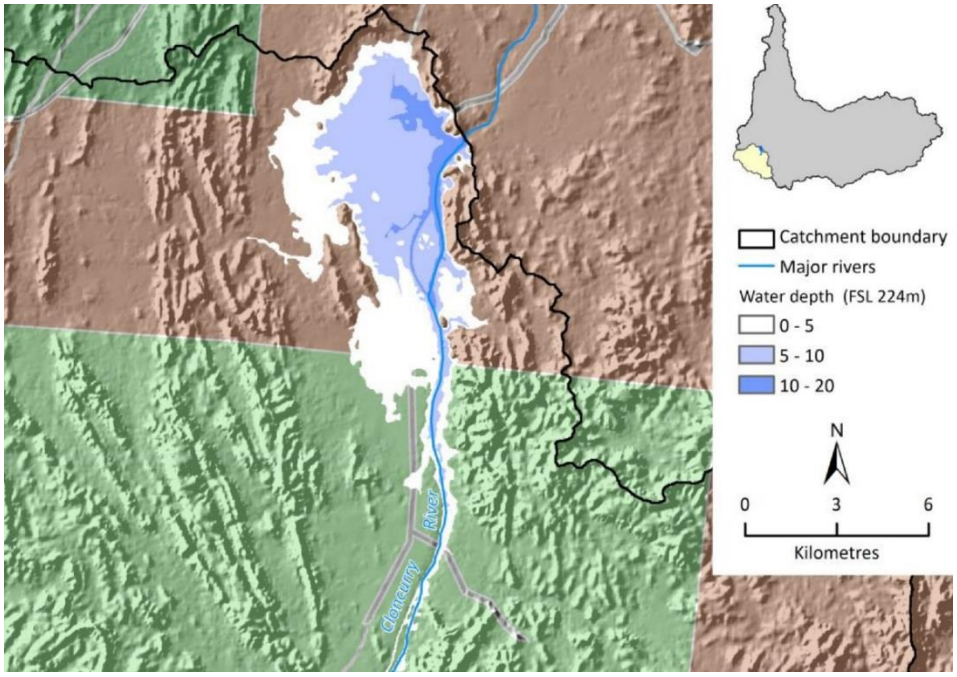
An additional saddle dam to the west, some 900m long and up to 5m high, would be required to contain flood rises in the reservoir.

The dam would generate a lake area, when the reservoir is full, of approximately 50km^2 (see Figure 2.2). The lake would generally be shallow.

Figure 2.1: Artist's Impression of Possible Cave Hill Dam

Source: Petheram *et al.* (2013, p.74)

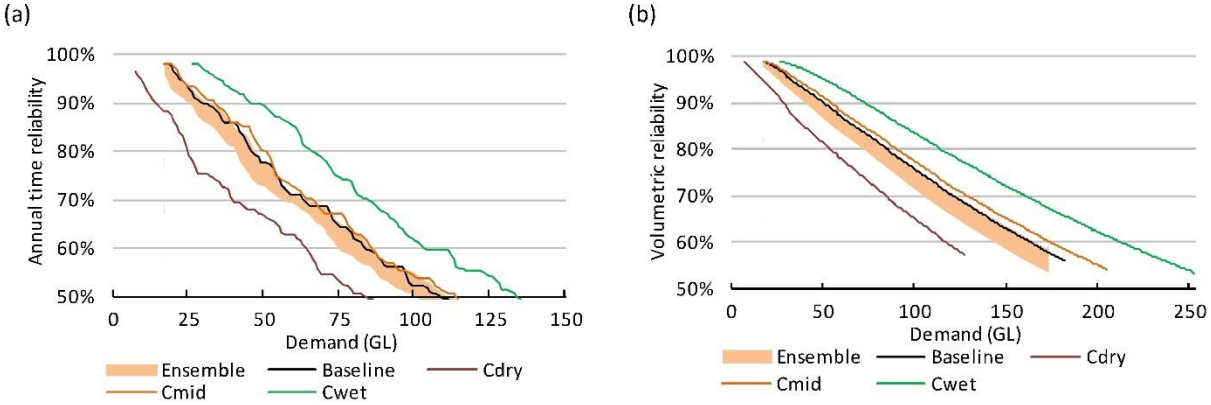
Figure 2.2: Footprint of Cave Hill Dam and Water Depth of the Reservoir When Full



Source: Petheram *et al.* (2013, p.75)

Despite being in a topographically unfavourable location for a dam and known geological difficulties of the site, Cave Hill Dam was nominated by CSIRO as a 'preferred site' because it could supply about 40GL of water in 85% of years and about 25GL in 90% of years (see Figure 2.3).

Figure 2.3: Reliability of Cave Hill Dam (a) Annual and (b) Volumetric



Source: Petheram *et al.* (2013, p.76)

Cave Hill Dam was considered by the Joint Select Committee on Northern Australia (JSCNA) in 2014 and put forward for further consideration on the basis that it provided a way of increasing supply of town water to Cloncurry, thereby supporting the potential development for a feed lot and abattoir, and expansion of mining and industry (JSCNA 2014).

At an irrigation water application rate of 10ML/ha, which is standard for irrigated pasture, 40GL would support irrigated pasture production on 4,000ha, or 40km^2. Petheram *et al*. (2013) identify the site as being potentially capable of irrigating around 12,000 ha of forage sorghum at 3-4ML/ha in most years, enough to potentially service a 65,000 head per annum feed lot.

While some uptake potential exists from the local Cloncurry Shire businesses and residents alongside existing resource operations, "the economic viability of a Cave Hill Dam based proposal would be largely dependent on irrigated agricultural production" (Petheram *et al*., 2013, p.75).

3. Review of Potential Funding Options

A review of existing funding models for the development and operation of water and other utility infrastructure was undertaken in order to inform the available options for Cave Hill Dam.

3.1 Funding Options

3.1.1 Traditional Funding Options

The following general infrastructure funding models have been identified in the literature:

- Public funding (i.e. via government debt/taxes).
- User charges.
- Producer levies.
- Private debt/equity.
- Public Private Partnerships (PPPs).

The first three models typically rely on various initial funding sources from within the public sector (Montoya, 2011). In contrast, PPPs (and purely private infrastructure investments) utilise borrowing or equity contributions from private sources.

Public Funding

Governments have traditionally funded long-lived public infrastructure assets with long-term debt instruments, such as bonds. An often-cited advantage of using public debt to finance infrastructure is that it involves a lower cost of capital (i.e. governments are generally capable of borrowing at lower interest rates than the private sector). An alternative perspective is that the risks associated with such borrowing are effectively underwritten by taxpayers (Montoya, 2011).

Alternatively, public funding can be sourced via increased taxes. In addition to broad State and Federal taxes, local government is able to raise infrastructure funding through municipal rates.

According to some experts, funding infrastructure investment primarily from tax revenue is one of the fairest means of financing infrastructure, as the public benefits are generally widely shared. Further, infrastructure investment using tax revenue is often presented as fiscally responsible, financially prudent and an important condition by which a high credit rating may be maintained, albeit via an increase tax burden on the population.

Private Debt/Equity

Purely privately funded infrastructure typically only occurs where broader business development considerations are significant (e.g. new roads to service a resource development) and commercially viable for the proponent.

While very efficient in some instances, purely private investment must be heavily regulated in many cases to avoid unfair monopoly pricing to consumers and ensure benefits flow to the broader population.

User Charges

For pubic and regulated services user charges are typically linked to the (whole of life) cost of service provision. They differ from taxes in a number of respects. For example, users can reduce their costs by reducing their use. User charges may be reinvested in the service.

The capacity for user charges to cover infrastructure capital, operational and maintenance costs depends on a number of factors, including the policy context and economic/industry operating environment. Most public water projects raise some revenue from user charges and access fees, with whole of life costing becoming increasingly common.

However, user charges represent a limited initial financing option for large scale projects and users' capacity to pay is not always adequate to cover all costs associated with

development and operations. Hence the majority of long-term infrastructure projects are financed through borrowings or capital injections from the government.

Producer Levies

Producer levies are charges that are applied to the suppliers of public infrastructure services. Development contributions are an example of this approach in use across Australia. Development contributions represent payments made by a developer to a consent authority to contribute to shared local infrastructure, facilities or services and certain types of State infrastructure.

Development contributions have grown as a source of funding for urban infrastructure, having been used to fund social and economic infrastructure, including parks, affordable housing and roads. However, the effectiveness of development contributions has been debated in the literature. For example, some argue that development contributions substantially reduce affordability for consumers.

Public Private Partnerships

PPPs are service contracts between the public and private sectors where the government pays the private sector to deliver infrastructure and related services over a long-term period.

Under such an arrangement, private sector parties contracted to build public infrastructure are financially responsible for its condition and performance throughout the lifetime of the resulting asset. A typical project would involve engaging one party in designing, financing, constructing, maintaining and, in some cases, operating the facility. The government makes payments only after the facility has commenced operations and such payments are made over the term of the contract based on services delivered against the achievement of key performance indicators — with these payments conditional upon performance (Department of Infrastructure and Regional Development, 2008).

PPPs involve a wide range of different contract types, with the key difference being the extent to which the private sector is responsible for the infrastructure being constructed. Some examples include:

- Design build.
- Operate maintain.
- Design build operate.
- Build own operate.
- Build own operate transfer.
- Lease own operate.
- Alliance.

Special Purpose Vehicles (SPVs), which can be designed as PPPs, are dedicated entities created for the purpose of providing public infrastructure and associated services. They include government trading enterprises and the spectrum of public/private provision. SPVs are commercial in nature and are created as off-budget entities.

Government trading enterprises typically provide economic infrastructure services in sectors like communications, energy, transport and water supply. They can be fully or partly owned by the government, with the government retaining a controlling interest. Government trading enterprises are operated to provide goods and services on a commercial basis by substantially or fully covering their costs. User charges are the main revenue source, but governments may also directly purchase or subsidise the services provided (Productivity Commission, 2009).

Establishing a PPP agreement in Queensland involves the following steps and approvals (Queensland Government, 2015):

- **Strategic assessment of service requirement**. Preliminary evaluation and initial determination of project priority and affordability.
- **PPP business case:** Confirmation of project priority and affordability, funding approval, and if PPP delivery, seek approval to proceed to Expression Of Interest (EOI) stage and release the EOI.
- **Binding bid or Request For Proposal (RFP) stage:** Approval of preferred proponent (or preferred bidder) status:
    - Approval to finalise project agreements within agreed parameters and proceed to financial close.
    - Approval for the Portfolio Minister to execute the final project agreements in consultation with the Treasurer and the Premier.
- **Management of project agreements**.

Infrastructure Funding Case Study: Virginia Recycled Water Scheme

The Virginia Pipeline Scheme in Adelaide commenced operations in October 1999 and was Australia's first major water recycling scheme to irrigate over 20 different crops, including many fresh vegetables.

Today, the scheme remains Australia's, and one of the world's, largest high-quality water recycling initiatives of its kind. Since it began, the scheme has provided farmers with over 100GL of Class A recycled water fit for the purpose of irrigating food crops which can be eaten raw, during a period which has been one of the driest on record in some parts of Australia.

The scheme was developed as a public-private partnership between Virginia Irrigation Association (representing market gardeners and other irrigators), SA Water and Water Infrastructure Group, the owner and operator of the scheme (recently purchased by TRILITY).

The first phase of the scheme was delivered by Water Infrastructure Group on a Build, Own, Operate, Transfer (BOOT) basis. The initial scheme was funded by a mixture of government equity, private equity and debt. At the end of the BOOT period (2018), ownership of the scheme will transfer to SA Water (Water Infrastructure Group, 2015).

In 2009 SA Water and Water Infrastructure Group completed the second phase of the Virginia Pipeline Scheme. The 20km pipeline expands the scheme into the Angle Vale area delivering an additional 3GL/year of Class A recycled water to 50 new customers. The $6.6 million extension was jointly funded by the Commonwealth with a $2 million Australian Government Water Fund grant and SA Water.

Table 3.1: Virginia Recycled Water Scheme Overview

Specification	Mundaring Water Treatment Plant
Type of Infrastructure Funding Model	PPP (Build, Own, Operate, Transfer)
Commenced	Stage one commenced 1999, stage two expansion 2009
Location	Virginia, South Australia
Infrastructure	Wastewater treatment plant and distributions infrastructure
Capacity	20 GL per annum class A recycled water
Project term	20 years concession
Capital cost	$25 million combined stages one and two
Investor	Water Infrastructure Group/TRILITY

Source: TRILITY (2016)

3.1.2 Further Funding Options

In additional to traditional infrastructure funding methods considered above, a range of additional mechanisms have been identified with varying levels of relevance to the Cave Hill Dam development, including:

- **Value Capture Levy:** A value capture levy aims to capture the uplift in land values that result from the planning process, development of land or construction of beneficial infrastructure. The levy is generally only captured when the property changes ownership and receipts are used to fund infrastructure that further supports development. A number of Australian jurisdictions apply the value capture levy including New South Wales, the Australian Capital Territory and Queensland.
- **Co-funding:** The government provides a capital contribution, either through payment of a proportion of the total capital costs or by providing an element of the works (for example enabling works) in order to reduce the funding requirement for the private sector. This has been used extensively in the UK and Europe, where capital contributions are made towards the end of the construction period to ensure that the private sector remains 'on the hook' for construction delivery. In Australia, governments have undertaken preliminary works as a way of reducing the total private funding requirement and also accelerating the delivery of the infrastructure.
- **Concessional/contingent loans:** Under this option, the government provides a proportion (say 50%) of the total funding requirement as a loan at a low rate of interest reflecting the government's cheaper cost of funding. Loan repayment levels can potentially be tied to the infrastructure operator's income in order to further de-risk the development.
- **Demand guarantees:** A demand guarantee supports a minimum uptake from consumers in order to support the development of the initial infrastructure. Irrigation water providers typically utilise "take or pay contracts" in order to reduce potential revenue volatility due to seasonal factors.

3.2 Strengths and Weaknesses

An overview of potential funding options for Cave Hill Dam (including potential strengths and weaknesses) are presented in Table 3.3.

Infrastructure Funding Case Study: Ord River Irrigation Scheme Stage 2

The Ord Irrigation Expansion Project is a WA State Government initiative to realise the full potential of available resources in the East Kimberley to create a vibrant and major regional centre. The expansion increases the size of the Ord irrigation area to about 22,000ha of agricultural land, which will provide major opportunities for growth and sustainability for the region's economic and social development.

A Chinese company, Shanghai Zhongfu was approved as the preferred agricultural developer of Ord stage two.

The company, trading as Kimberley Agricultural Investment will develop 15,000 hectares and plans to invest up to $700 million over six years to establish the sugar industry in Kununurra, including a $250 million sugar mill to process four million tonnes of cane a year.

Table 3.2: Ord River Irrigation Scheme Stage 2 Overview

Specification	Ord Irrigation Scheme Stage 2
Type of Infrastructure Funding Model	Public funding for infrastructure, agricultural lands leased to private proponents for development
Commenced	2014
Location	Kununurra, Western Australia
Infrastructure	Irrigation channels and associated works
Maximum capacity	400 GL per annum 13,400 ha of irrigation
Project term	Agricultural lands 50-year peppercorn lease
Capital cost	$311 million
Investor	WA Department of Regional Development and Lands/ Kimberley Agricultural Investment

Source: Kimberley Development Commission (2014)

Table 3.3: Funding Options Overview

Funding Method	Strengths	Weaknesses	Situations Where Most Appropriate
Public Funding			
General budget appropriations	• Increased scrutiny – promotes accountability and transparency for using public funds • Low transaction costs compared to most other financing methods	• Uncertainty in the availability of cash required for the most efficient approach to building the asset • Non-discretionary spending could take priority thus reducing available funds • Inefficient – could reduce incentives to explore other more efficient funding options such as user charges • Full public funding could reduce scope to allocate project risks to those best able to manage them	• Depends on whether the project is to be funded through taxes, borrowings or user charges - see below
Taxation revenue	• No impact on credit rating • State tax distributes the cost of infrastructure broadly and is the fairest means of financing infrastructure if the benefits are shared widely • Local government taxes are able to harness the relationship between increased property value resulting from infrastructure provision and allow for the spreading of costs across generations benefitting from the infrastructure (e.g. assuming rate hikes are permanent) and over all property owners within a specific area	• Taxes can distort economic outcomes and do not merely redistribute money and resources. Tax has little impact on encouraging efficient levels of use of infrastructure services • Taxation revenue may vary depending on government policies and macroeconomic conditions e.g. business cycles	• Most suited for infrastructure projects with broad based benefits, where such benefits are realised over the short to medium term
Borrowings	• Can be used to accelerate or bring forward delivery of key infrastructure projects • Incurs a lower cost of capital compared to private sector financing • Aligns cost of infrastructure more closely to the benefits that accrue over time, improving dynamic efficiency	• May have some impact on credit rating if it exceeds debt thresholds set by rating agencies	• For projects where benefits outweigh the costs so that macroeconomic efficiency is improved • Debt can be viewed as a tax on the future generations and is, therefore, suited to projects with long term benefits (i.e. debt financing allows for the matching of benefits and costs over time) • Project must pass stringent tests (as outlined above), including that it is not able to be done on a commercial basis and that debt is able to be funded out of the operating budget
Private Funding			
Private debt/equity	• Aligns project risks with main beneficiaries • No direct cost to government	• Requires significant regulatory oversight for 'natural monopoly' type infrastructure • Investment decisions based on commercial returns vs. community benefit • Higher costs of capital	• For projects whose benefits directly align with the those providing the infrastructure (e.g. integrated water supply and agricultural development)

Funding Method	Strengths	Weaknesses	Situations Where Most Appropriate
User charges	• Equitable as based on the user pay principle to fund infrastructure • Efficient as it encourages best allocation of resources through efficient pricing	• Demand for goods and services may vary from what was anticipated at the planning stage, thus affecting financial returns • Difficult to achieve efficient pricing, users charges are usually set too high (e.g. monopolies) to encourage optimal use or too lower to cover the cost of capital (to encourage use to obtain a commercial return) • Could have high administration costs	• For projects where there is a link between the service provided and the fee charged for the service
Development contributions	• Long history of use in Australia and more politically acceptable than higher taxes as a way of financing new infrastructure • Contributions coincide with the point in time at which infrastructure investment is required – typically at development or construction stage. • Efficient, as includes infrastructure costs into the price of land whether is passed backwards to the seller or forwards to the buyer. The price signal improves allocative efficiency and encourages the development of land that is relatively low cost to develop	• Less scrutiny of projects as it does not involve public funds • Government must fund the gap between the cost of infrastructure required and development contributions • Transaction costs can be high if the contribution system is complex and where long negotiations or disputes occur • Charges affect resource allocation including discouraging development in locations where service provision would be expensive hence developers have strong incentive to focus upon lower cost areas • There are split incentives between developers who want to provide minimum infrastructure and government planners who would like to overbuild infrastructure	• Used for land development such as greenfield sites, usually in high-growth and low service provision cost regions
Public Private Partnerships			

Public private partnerships	• Supports increased provision of infrastructure without adding to government borrowing or debt
	• Efficient:
	  ○ Allocates risk to where it is best managed
	  ○ Use of project finance creates incentive to deliver project on time when cash flow generated is required to repay debt
	  ○ Bundling all building activities from design to maintenance aligns incentives for low cost construction. This minimises the lifetime costs of operations, thus containing whole-of-life costs
		• Less scrutiny of projects as public funds are not involved. Accountability to the Parliament and public is also reduced
		• Cost of capital could be higher than traditional financing due to the complex project financing arrangements involved
		• High transaction costs associated with contractual development
		• Longer lead times due to the time associated with tendering and contract development and negotiation
			• Used to accelerate or bring forward the delivery of a wide range of key infrastructure projects.
			• Australia has used PPPs to build and fund hospitals, correctional facilities, wastewater treatment facilities, communication networks, schools, desalination plant, courts and tollways

Funding Method	Strengths	Weaknesses	Situations Where Most Appropriate

Specific-purpose securitised borrowing	• Exposure to market-based disciplines – funds are raised from competitive debt markets hence projects are assessed based on commercial merit
	• Efficient
	  ○ Stronger link between performance of asset and servicing of debt leading to greater due diligence on viability of project by investors
	  ○ Based on user pays principle. Revenue from asset is used as bond repayments thus improving efficiency in the planning and operation phases of the asset. Ensures the beneficiaries of the asset pay and prevents intergenerational transfer of debt
		• Market distortions arising from tax-exempt status
		• Competition and innovation implications
		• Allocating resources away from non-tax exempt investments
		• Tax burden implications
		• Use of tax-exempt bonds encourages rent-seeking activities
			• For all types of economic infrastructure where there is a revenue source that can be used to repay bonds
			• Also suitable for social infrastructure where taxation is the source of debt repayment. In this case, it is considered a form of public borrowing
			• No longer favoured by Australian governments as currently public borrowing is undertaken through bonds issued by central borrowing authorities (CBAs) in each jurisdiction, and bonds are not linked to specific assets or activities
			• Certificate of participations are however used by municipal governments in the US to fund construction of capital facilities at the municipal level

Value capture levy	• Captures windfall gains from individual land/property owners at a point in time and redistributes it to many across time	• Disincentive for landowners to bring land to market if levy is not permanent or if levy rate is too high • Requires a legislative framework and mechanism in place to capture base land value (before development) and calculate the value of the levy	• Suitable in circumstances where land is being rezoned, development has been approved or where beneficial infrastructure has been constructed that increases land value • The value capture levy is typically used to fund urban infrastructure projects • Applicable for a defined area or whole jurisdiction

Specific purpose levies (SPLs)	• Raises finance through regular and easily altered means	• Inefficient:
		  ○ Distorts resource allocation decisions and may be levied on a narrow base
		• Inequitable:
		  ○ Depends on relationship between those levied and those benefiting from use of funds. Unless SPL is broad based, it will be generally inequitable
		  ○ Lack of community support as it is often viewed as a targeted tax with no assurance that revenue will benefit those covering the cost of the development
			• Ad hoc levies to raise finance for a specific purpose
			• Examples:
			  ○ Queensland flood levy for infrastructure reconstruction
			  ○ Landfill levies in Victoria for funding waste management infrastructure

Source: Allen Consulting Group (2011), AEC

Potential Funding Mechanism: Northern Australia Infrastructure Facility

Infrastructure deficiencies have been identified as major issues in Northern Australia in both the Green Paper on Developing Northern Australia and the Joint Committee Inquiry on Developing Northern Australia Final Report.

Infrastructure Australia's Northern Australia Infrastructure Audit found, among other things, that the limited population and often small industry sizes of Northern Australia can make it difficult to capture sufficient infrastructure economies of scale that allow commercially viable infrastructure services at competitive prices.

A number of measures were included in the Federal 2015/16 Budget to address these issues. The largest of which is the Northern Australia Infrastructure Facility. This facility will provide concessional loans up to $5 billion with the objective of increasing private sector investment in infrastructure in Northern Australia. The cost of the loan facility to Government will be the differential between the regular and concessional interest rates.

A draft mandate direction for the facility has been released and is currently receiving public feedback submissions (Commonwealth Government, 2016).

4. Stakeholder Consultations

4.1 Consultation Outcomes

Consultations were undertaken as part of this project. These consultations involved key water industry stakeholders in the Mount Isa—Cloncurry region, and external funding experts. Consultees included:

- Local government representatives.
- Existing regional resource operators.
- Private social infrastructure capital funding institutions.
- Public water infrastructure operators.

Stakeholders consulted for this project are presented in the table below.

Table 4.1: Stakeholder List

Stakeholder	Position/Organisation
Julie-Anne Mizzi	AMP Capital: Principal Social Infrastructure
Mark Roberts	General Manager CuDECO Rocklands Project
David Neeves	CEO: Cloncurry Shire
Rory Whitefield	Director: Platform Capital
Trevor Gray	Mount Isa Mines Central Services General Manager: Glencore
Alistair Cowden	Managing Director: Altona Mining
Russel Payton	Manager Business Development: SunWater

Source: AEC

The following sections outline a summary of stakeholder input to key areas regarding funding and operating the proposed Cave Hill Dam.

Demand Outlook

- The existing resources sector could potentially benefit from the construction Cave Hill Dam. However, industry uptake would be highly contingent on the security of supply and price.
- The major Glencore-owned mines in the region, Mount Isa Mines and Ernest Henry Mine, draw water from the Lake Moondara/Lake Julius water scheme, which was established with majority funding by MIM.
- Since MIM built Lake Moondara and BHP built Olympic Dam, there haven't been any ore bodies discovered at a size that would warrant a single mine building a major dam.
- For a smaller mine operator investing in a dam, timing and cost are critical:
    - The investment needs to be seen in the context of a short (e.g. 10-15 year lifetime of the mine) there is typically a significant mismatch with the 40-60 year lifespan of a dam.
    - If a new ore body is just being discovered and the planning, approvals and development of a mine and the dam are aligned, then it is more likely to proceed 's. However, that may only be the case for possibly one mine in the region, and then the cost is a major barrier.
    - Any discussions about mine investment in the dam should proceed on a Memorandum Of Understanding (MOU) basis while the approval of the mine are uncertain.
- De-watering from the pits is the mine's main water source with a significant focus on recycling; also, pumping groundwater from (approved) bores is a financially superior proposition to new dam construction.
- Existing operators would only consider buying in "new" water if it was "critical" water i.e. could be delivered with 100% certainty in a time of need as an insurance policy

and would justify very high user charges. There is little appetite within the resources sector for "take-or-pay" arrangements with very high fixed costs that need to be met even if no new water is needed.

Public Funding/Operation Options

- Local government has very little capacity on its own to invest in major infrastructure the scale of Cave Hill Dam, but would certainly consider making a suitably scaled contribution and act as an advocacy agency for the project. Council has approached the QLD State Government previously to explore securing funding for the dam using municipal bonds.
- SunWater is a developer, owner and operator of bulk water infrastructure throughout regional Queensland, with a portfolio of assets with a replacement value in the order of $9 billion. The asset base includes 19 major dams, 63 weirs and barrages, 14 industrial/commercial bulk water pipelines and eight irrigation distribution systems. SunWater's customers include major mines, power stations, irrigators, and local authorities.
- As a Government owned corporation, SunWater has a commercial charter. When it comes to developing infrastructure, investments are based on business cases that assess all relevant commercial aspects and risks associated with the proposal. Costs associated with developing the infrastructure, including the costs of investigations are recovered from customers, together with a commercial rate of return on the capital invested through long term "take-or-pay" contracts:
    - As a first step in the development process, SunWater would perform a water supply options study for a customer seeking water to investigate and recommend the most appropriate water supply solution. Subsequent steps in the development process would include:
        - More detailed assessment of the preferred solution (including obtaining the necessary development and environmental approvals, cultural heritage management plans, Indigenous Land Use Agreements (ILUAs), and Environmental Impact Statement (EIS)).
        - Once the project is sufficiently investigated to demonstrate the remaining development risk is acceptable, water supply and/or water transport agreements would be developed with the customer/s.
    - Performing the investigations and obtaining the necessary development approvals for these projects takes significant investment and for a large dam can typically be between $10 million to $20 million and take between three and up to eight years from commencing the investigation. A feasibility study (such as the one that the North West Queensland Strategic Plan Water Sub-committee is currently seeking funding for) represents an early step in that process.
    - Having unallocated water held as a strategic reserve within the relevant Water Resource Plan enables the dam to be built, and the water allocations realised.
- SunWater is currently investigating a number of bulk water storage projects including the Nathan Dam, the Eden Bann Weir Raising and Rookwood Weir. Another example is the Connor's River Dam in Central Queensland for which SunWater have recently extended the EIS. However, SunWater has discontinued work in this case due to a lack of financial commitment from customers.
- As Queensland's regional bulk water developer SunWater is interested in being involved in any water infrastructure project with a water demand that supports a rigorous business case.
- When SunWater is the proponent who develops the water supply infrastructure, it is also typically the owner and operator.

Private Funding Considerations

- There is a reasonable appetite for investment in social infrastructure and enough capital in the marketplace.

- Private capital is currently being sought for a range of water related projects, including:
  - Water treatment plants.
  - Water pipelines.
  - Desalination plants.
- There exists a broad spectrum of private infrastructure funding and operational models:
  - On one end: almost fully corporatised assets, e.g. airports, which are not heavily regulated in terms of charges and have monopolistic characteristics.
  - On the other end: very strongly regulated and structured PPP models, which typically apply to water infrastructure. The investor would need to meet strict Key Performance Indicators (KPIs) in order to get monthly payments from the government. This model involves a very high level of transparency of costs and revenue. The incentive for the investor is in pre-agreed 5-year plans and possibility of achieving the set KPIs more cheaply, which adds to return on revenue.

    While negotiating these types of contracts is difficult, they typically reach a suitable outcome between public and private stakeholders.
- Projects that fail to attract private investors are "not bankable". Key reasons projects fail to attract private investment include:
  - Payback period too short: e.g. SA offered up construction of new Adelaide court precinct, but the concession timeframe was only 15 years, which would have meant that to get the required return the investor would have had to charge unreasonably high rents.
  - Insufficient size: e.g. Toowoomba by-pass ended up receiving a federal grant, and the equity ticket became very small, which limited interest.
  - Inappropriate risk transfer: e.g. NSW Hospital included the provision of clinical services in with the construction of the hospital, which limited the potential pool of investors was reduced to just two candidates.
- Key considerations for marketing Cave Hill Dam for private investment:
  - Critical to have full feasibility work and Expression of Interest (EOI) completed.
  - Return on revenue: Investors do not get paid until water is used and if they are required to be there from time zero the rate of return shifts to the end and necessitates very high water charges. An alternative model of publically/grant funded development is potentially more attractive to a private water operator.
  - Risk: Outcome of the EOI is uncertain. It will be critical to have the required consents and approvals in place as this will decrease the risk for investors.
- There is significant interest from Asian investors in the infrastructure space. However, progressing through to greenfield investment is typically a long term process.
- Given their significant focus on agriculture/food as well as capital, they are likely to prefer an integrated model and would likely be more interested in an IFED style model (dam + irrigation) than just building/operating the dam in isolation.
- It is important to involve equity in the design of the investment model, right from the beginning:
  - Consider the potential for compartmentalisation of private investment offerings, allowing the best suited investors to take on specific aspects of the development.
  - Investors want to have a choice of partners and work with trusted partners. Even though they may only fund one component, they strongly consider at the total best package (across building, financing, operating).

Other Notes

There is currently insufficient information on Cave Hill Dam to generate a profile that could be used to engage with potential investors. Ideally, an Information Memorandum (IM) should be developed, strategically aligned to the developing Northern Australia policy:

- Critical to the success of the venture will be a suitable financial model and investment plan. This could be developed in parallel with a feasibility study.
- The project may be of interest to investors with a long-term cash and capital growth plan. Such investors might include superannuation funds, pension funds and also Asian investors who seek strategic investment in Northern Australia through lower-cost projects.
- Coupling the proposition of the infrastructure and agricultural investments would increase interest in the project, for example combining the dam with property acquisitions for irrigation development. In such a scenario, the investor would control the water resource (build and/or operate) and have a cropping enterprise. A fully integrated supply chain could potentially include downstream processing.
- Once the feasibility works are completed, the opportunity could be put out to global private tender, involving possibly 20 pre-qualified international tenderers. It could be offered on the basis of a PPP or a strictly private investment option.

4.2 Implications for Funding Options

A number of key implications for infrastructure funding have been identified through the consultation process. Of significant note:

- Both public and private funding options for the infrastructure are potentially available.
- Regulatory approvals represent a substantial hurdle for private investment in terms of risk and timeframes. Ideally, approval work (in particular EIS) would be led through a State agency.
- Demand levels and capacity to pay are key considerations for both public and private funding sources:
    - Demand from existing resource operators is identified as significantly limited for existing operations, and new resource finds would need to be of a significant scale to justify a resource proponent developing Cave Hill Dam.
    - Agricultural development appears the most feasible source of uptake to support development.
    - Agricultural development can underpin additional economic development in the region, through trade and processing, resulting in additional industrial-urban water demand.
- An integrated approach to development is the best option for attracting private funding, covering both water resource development and agricultural land consolidation/release.

Infrastructure Funding Case Study: Mundaring Water Treatment Plant

The $300 million Mundaring Water Treatment Plant upgrades one of WA's key water schemes. The development also represents a new way of undertaking public water infrastructure projects within WA.

The recently-opened plant provides high-quality drinking water to 100,000 people connected to the Goldfields and Agricultural Water Supply Scheme.

The plant was built as a result of the first Public Private Partnership (PPP) in WA's water industry. It was designed, funded and built by Helena Water, a consortium that includes Spain's ACCIONA Agua, TRILITY (a subsidiary of Mitsubishi Corporation) and Lloyds Bank.

Under the public private partnership, the Helena Water consortium has contracted the ACCIONA TRILITY Joint Venture (ATJV) to operate and maintain the 165 million litre per day Water Treatment Plant, a new pumping station and interconnecting pipework for the next 35 years.

After that, the facility will be handed over to the Water Corporation.

Table 3.1: Mundaring Water Treatment Plant Overview

Specification	Mundaring Water Treatment Plant
Type of contract	PPP (design, build and operate)
Commenced	2014
Location	Mundaring, Western Australia
Infrastructure	Water treatment plant, pumping station and integration works
Maximum capacity	165 ML/d expandable to 240 ML/d
Project term	Design and Construct: 2 years Operation and Maintenance: 35 years
Capital cost	$300 million
Investor	Acciona TRILITY Joint Venture Pty Ltd

Source: Acciona Australia (2015)

5. Suitability for Cave Hill Dam

The following sections provide an analysis of the suitability of potential investor/ funding model combinations for Cave Hill Dam.

5.1 Cave Hill Dam Considerations

Two key factors impact the most appropriate funding sources for the development, specifically:

- **The commercial return for private investment**. Where the private sector market has sufficient commercial incentive to provide the infrastructure, they are likely the best placed funding source for the development.
- **Public benefit**. Where the private market fails to deliver the development on commercial grounds, the case for public development and/or funding support is largely justified based on the public/community benefits derived from the development.

A high level overview of these factors in relation to Cave Hill Dam are presented in the sections below.

Commercial Return

The appetite for private investment at any level in Cave Hill Dam will be largely dependent on the commercial return proposition and payback period. Previous works by Petheram *et al*. (2013) assessed the commercial potential of Cave Hill Dam to irrigate 12,000 ha of forage sorghum in order to supply a locally based feed lot and abattoir.

Based over a 30-year investment period, the authors found "the revenue generated from the scheme (total crop gross margins) does not offset the capital, operation and maintenance costs of the scheme-scale and on-farm infrastructure over the life of the investment" Petheram *et al*. (2013, p. 298).

More detailed feasibility works would need to be undertaken to assess alternative commercial investment models to support the development. However, based on the evidence available it would appear that a purely commercial sector led development is unlikely. This is common due to the high up-front costs and long-term benefit nature of large scale dam infrastructure.

A level of public support is likely to be required in order to address the commercial market gap and support the development of Cave Hill Dam.

Such leading infrastructure support is typical for new industry development, particularly in Northern Australia where the limited population and often small industry sizes of make it difficult to capture suitable infrastructure economies of scale (refer to case study on the Ord River Scheme Stage 2).

Public Benefit

To justify public infrastructure funding support, projects need to provide substantial socio-economic benefits to the region. Within this context, Cave Hill Dam presents a strong preliminary case as identified by Alluvium (2016). Key public benefits which would potentially be derived from the development include:

- **Additional resilience of the regional water supply system**, to an area highly susceptible to drought. The scale and location of Cave Hill Dam provide the most additional resilience of all identified water storage options in the Mount Isa-Cloncurry area (Alluvium, 2016).
- **Proximity/connectivity within the existing regional water supply scheme,** Cave Hill Dam ranks favourably compared to alternative development options for its location within the existing water supply network (Alluvium, 2016).

- **Industry development potential,** with significant agricultural and potential ancillary tourism applications. Cave Hill Dam offers a single large-scale water storage option, providing the best potential for attracting irrigated agricultural production on a suitable industry scale. The development may also assist in facilitating future resource developments in the area.
- **Strategic alignment.** The proposed development is strongly aligned with both State and Federal strategic objectives to develop Northern Australia and the agricultural export sector.

The significant public benefits potentially derived from Cave Hill Dam make it a strong candidate to receive public support to help offset the potential gap in the commercial returns generated by the development.

5.2 Funding Model Options Analysis

AEC has developed a framework for assessing the various identified funding options for developing and operating Cave Hill Dam. In assessing each of the options, the following key factors were considered:

- Operational viability/risk.
- Costs to consumers.
- Costs to the public sector.
- Likelihood of attaining funding/investment.

For each of the five criteria, a qualitative rank was assigned to each potential option based on overall suitability for Cave Hill Dam as defined in the table below.

Table 5.1: Ranking

Rank	Definition
5	Very Highly Suitable
4	Highly Suitable
3	Suitable
2	Marginal
1	Unsuitable

Source: AEC

A detailed breakdown of the criteria and weightings is provided Appendix A, with a summary of the key outcomes presented in the table below.

Table 5.2: Options Analysis Summary Outcomes

Funding Method	Overall Outcome /5	Notes
Public Funding		
General budget appropriations	4	• Significant capacity at a State level to develop Cave Hill Dam, subject to demand and financial feasibility • Strong public benefit outcomes to support a public-led development • Limited capacity identified at local level to provide significant funding
Taxation revenue		
Borrowings		
Private Funding		
Private debt/equity	3	• The potential for purely private model is dependent on a viable integrated dam and agricultural development • Scale and likelihood of commercial returns is subject to significant further feasibility assessment. However, due to the long-term nature of the infrastructure, returns are unlikely to support a purely commercial development without a level of public support/subsidy
User charges	3	• Significant capacity to utilise user charges to as a method to either fully or partly fund operations beyond initial start-up capital • Capacity for user charges to fully cover (whole of life) costs plus scheme operator margins appears limited

Funding Method	Overall Outcome /5	Notes
Development contributions	2	• Limited scope to apply a contributions model of a scale sufficient to contribute a significant portion of the required funding
Public Private Partnerships		
Public private partnership	4	• Potential to leverage private sector entrepreneurship and expertise combined with public regulatory/financial support • Opportunity to develop the infrastructure with a reduced burden on public finances
Alternative Funding Methods		
Specific-purpose securitised borrowing	3	• Some potential as a funding mechanism depending on the final proponent • Potentially high capital cost relative to alternative funding sources identified
Value capture levy	3	• Some scope to apply a value capture levy across new irrigated agricultural lands (assuming freehold release) • Limited capacity to significantly cover the costs of development
Specific purpose levies (SPLs)	2	• Limited base to support a SPL to develop Cave Hill Dam

Source: AEC

The above analysis presents three main initial funding models for developing Cave Hill Dam, each of which is considered in more detail below.

A Public Sector Led Development

This option would see the infrastructure funded primarily through State and Federal means. Dam development would be progressed alongside irrigated agricultural lands consolidation/release in order to develop a user charges revenue stream to support operations. Key strengths of this model include:

- Consideration/capture of the significant public benefit values associated with Cave Hill Dam.
- Lower costs of capital, with the potential to leverage State and Federal borrowing capacity.
- Strategic alignment with both State and Federal development objectives for agriculture and Northern Australia.

A Private Integrated Supply Chain Development

The opportunity to develop Cave Hill Dam to support broader irrigated agriculture and value adding may have significant private investment potential. However, due to the high cost of private capital and potential timing mismatch between private return requirements and long-term dam infrastructure benefits, significant public support may be required to facilitate a private sector led-development. Avenues through which public support can increase the potential for the private development of Cave Hill Dam include:

- Detailed feasibility study works, most likely focusing on an integrated investment opportunity, combining the dam infrastructure with consolidated agricultural lands made available to support an integrated agricultural supply chain.
- Determination of planning and environmental approvals, to decrease the risk and timeframes for returns on private investment.
- Co-funding and/or concessional loans to decrease the up-front development costs and lower the cost of private capital to a level more suitable for long-term infrastructure funding.

In return for initial support, concessions and regulations may be negotiated to ensure fair pricing and supply availability for the surrounding community to capture the full development and water security benefits of the Cave Hill Dam project.

Public Private Partnership

A properly structured PPP is a strong fit for the Cave Hill Dam development, due to:

- The significant private business opportunities generated by the development. A PPP would best leverage both the commercial and public benefit aspects of the project.
- Potential to extract long-term value-for-money through an appropriate risk transfer to the private sector over the life of the project (from design/construction to operations/maintenance).
- Potential to leverage the public sector's lower borrowing costs in order to facilitate private sector risk taking and entrepreneurship to support a key regional development.

Potentially viable PPP models include a design build operate, build own operate, build own operate transfer or lease own, operate.

Infrastructure Funding Mechanism: National Water Infrastructure Development Fund

The National Water Infrastructure Development Fund will provide $450 million to construct water infrastructure in partnership with State and Territory governments and the private sector, including a component for Northern Australia of approximately $170 million. This funding will be available from 2017-18.

In order to be eligible for funding, projects must meet the following criteria (Commonwealth Government, 2015):

- *Be nationally significant and in the national interest.*
- *There must be strong state or territory government support with capital contribution and involvement of the private sector and where appropriate local government.*
- *The investment should provide the highest net benefit of all options available to increase access to water, taking into account economic, social and environmental impacts.*
- *Address a market failure which cannot be addressed by proponents, state and territory governments or other stakeholders and limits a project of national significance from being delivered.*
- *Align with the Government's broader infrastructure agenda to promote economic growth and productivity, or provide a demonstrable public benefit and address a community need.*
- *Align with the National Water Initiative principles including appropriate cost recovery and, where full cost recovery is not deemed feasible, any subsidies are fully transparent to the community.*
- *If providing capital, a consistent, robust analysis of costs and benefits is used and assessment is undertaken by Infrastructure Australia or similar experts.*

6. Action Plan

6.1 Summary of Outcomes

This study has identified a range of potential investment models to support the development of Cave Hill Dam. Consultation with regional and investment stakeholders has uncovered a number of potentially viable funding models and sources worthy of further consideration and investigation.

Despite the significant economic and public benefit potential of the project, it is likely that either a public or private proponent would face substantial risks in developing the initial dam and distribution infrastructure. Uptake from the current resources sector has been identified as modest, with development viability largely dependent on associated irrigated agricultural production in the absence of a significant new resource development being established in the surrounding area.

A number of preliminary steps should be taken to minimise demand risk, in order to maximise the potential for successfully developing Cave Hill Dam, including:

- Initial feasibility work and business case.
- Establishing planning and environmental approvals to support the development of a suitable Expression of Interest (EOI), potentially within a PPP framework.

Furthermore, an appropriate financial contribution at the State and/or Federal level has the potential to substantially increase the financial viability of developing the up-front infrastructure. Given current strategic interest in increasing agricultural production, Cave Hill Dam presents a suitable project to receive significant support on a number of grounds:

- Potential to improve the viability and productivity of strategic agricultural lands.
- Potential to increase Australia and Queensland's agricultural production.
- Substantial employment and regional economic development outcomes during construction and once operational.

Concessional financing through the $5 billion developing Northern Australia Fund and co-funding through the National Water Infrastructure Development Fund are two key avenues through which the public sector can support the development of Cave Hill Dam.

6.2 Action Plan

The following high-level table identifies the key actions and timeframes required in order to make the Cave Hill Dam project investment ready.

Table 6.1: Action Plan

Stage	Actions	Responsible Stakeholders
Commercial Viability Considerations		
Feasibility Study & Information Memorandum	Develop a full evidence base to support the commerciality of Cave Hill Dam for potential investors, including: • Full financial costs of design and engineering • Uptake demand • Return on investment • Full cost pricing of delivery	North West Queensland Strategic Plan Water Sub-committee
Approvals		
Approval Requirements	Obtain relevant environmental approvals, water licence, interference structures, land inundation, referable dam status would need to be explored and clarified.	State Government
Unallocated Water Availability	Unallocated water is reserved under water planning instruments and can be made available by The Department of Natural Resources and Mines for future consumptive use without compromising the security of existing users or the environmental values within a catchment.	Department of Natural Resources and Mines (NRM)
Environmental Impact Statement	The Department of Environment and Heritage Protection is responsible for coordinating EIS processes under Chapter 3 of the Environmental Protection Act 1994. This can be a protracted experience.	Department of Environment and Heritage Protection
Investment Attraction		
Expression of Interest and Business Case	Confirmation of project priority and affordability, funding approval, and if PPP delivery, seek approval to proceed to EOI stage and release the EOI.	State Government North West Queensland Strategic Plan Water Sub-committee
Investment Attraction and Facilitation	• Confirm potential inducements and incentives for developing Cave Hill Dam • Research potential investors and funding sources • Applications to potential funding sources/approach potential investors, including maintenance of up-to-date data • Ongoing investment facilitation and support	State and Commonwealth Governments, North West Queensland Strategic Plan Water Sub-committee

Source: AEC

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Appendix A: Funding Options Analysis

Table A.1: Funding Options Analysis

Funding Method	Operational Viability/ Risk	Cost of Capital	Costs to Consumers	Costs to Public Sector	Likelihood of Implementation	Overall Outcome /5	Notes
Public Funding							
General budget appropriations/ Taxation revenue/ Borrowings	4	5	4	3	4	4	• Significant capacity at a State level to develop Cave Hill Dam, subject to demand and financial feasibility • Strong public benefit outcomes to support a public-led development • Limited capacity identified at local level to provide significant funding
Private Funding							
Private Debt/Equity	3	3	3	5	3	3	• The potential for purely private model is dependent on a viable integrated dam and agricultural development • Scale and likelihood of commercial returns is subject to significant further feasibility assessment. However, due to the long-term nature of the infrastructure, returns are unlikely to support a purely commercial development without a level of public support/subsidy
User Charges	3	n.a.	3	5	3	3	• Significant capacity to utilise user charges to as a method to either fully or partly fund operations beyond initial start-up capital • Capacity for user charges to fully cover (whole of life) costs plus scheme operator margins appears limited
Development contributions	4	3	4	4	2	2	• Limited scope to apply a contributions model of a scale sufficient to contribute a significant portion of the required funding
Public Private Partnerships							
Public private partnership	3	5	4	5	4	4	• Potential to leverage private sector entrepreneurship and expertise combined with public regulatory/financial support • Opportunity to develop the infrastructure with a reduced burden on public finances
Alternative Funding Methods							
Specific-purpose securitised borrowing	3	3	4	4	3	3	• Some potential as a funding mechanism depending on the final proponent • Potentially high capital cost relative to alternative funding sources identified
Value capture levy	3	4	3	4	3	3	• Some scope to apply a value capture levy across new irrigated agricultural lands (assuming freehold release) • Limited capacity to significantly cover the costs of development
Specific purpose levies (SPLs)	4	4	3	4	1	2	• Limited base to support a SPL to develop Cave Hill Dam

Source: AEC

AECgroup

Outcome Driven

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