Burdekin Falls Dam

Fact Sheet: Raising Project

December 2022

North Queensland is growing – and so is long-term demand for water in the region.

A secure water supply is essential for economic development, whether for agriculture, industry, urban communities, or emerging industries, such as hydrogen.

To meet these future needs, there is a requirement for safe and cost-effective water infrastructure solutions.

Sunwater is focused on delivering projects that provide significant economic benefits to Queensland.

As part of this commitment, we have been investigating a proposal to raise Burdekin Falls Dam to meet future water demand and support the dam's long-term safety.

A comprehensive forecast of water demand to 2050 was undertaken to inform the potential raising height.

An independent assessment concluded a two-metre raising would address projected water demand, while also significantly enhancing growth opportunities in North Queensland.

As a result, an environmental impact statement (EIS) is now being progressed for a two-metre raising of the dam.

About the project

Burdekin Falls Dam is one of several dams being upgraded as part of Sunwater's Dam Improvement Program.

The Burdekin Falls Dam Raising Project proposes to raise the existing dam by two metres to increase water supply and support future water demand in the Burdekin and surrounding regions. The project will also:

- increase the dam's resilience to extreme weather events
- bring the dam in line with modern engineering design standards
- ensure the dam meets the safety requirements set out in the *Water Supply (Safety and Reliability) Act 2008* (Qld).

Proposed works include:

- raising the existing dam spillway using concrete buttressing
- raising the abutments and saddle dams
- constructing a new right-bank saddle dam.

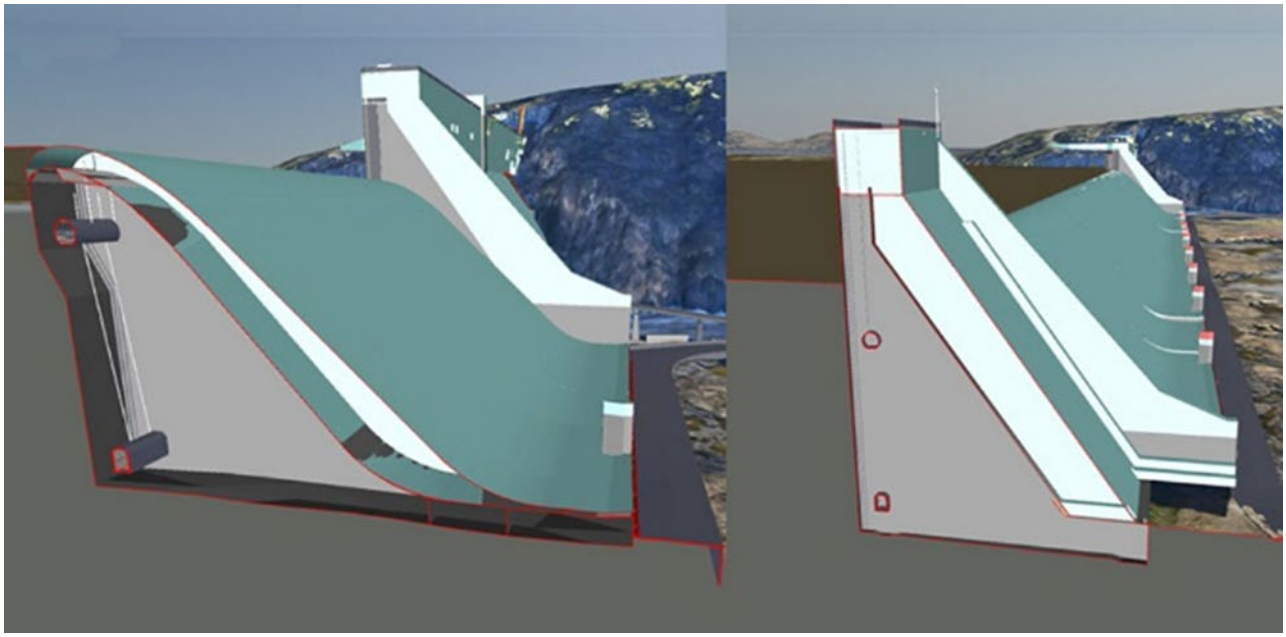


Figure 1: Preliminary design for dam raising and improvement works – cross section of spillway and abutment raising for illustrative purposes only.

Project status

Sunwater submitted a detailed business case (DBC) for the Burdekin Falls Dam Improvement and Raising projects to the Queensland Government for review.

The DBC outlines options to increase the dam's water supply and long-term viability and reviewed the social, environmental, economic, and financial feasibility of the projects.

The proposed raising requires an EIS, that will describe and assess:

- the current environment around the dam
- potential environmental, economic, and social impacts and benefits of the project
- how potential impacts can be avoided, minimised, mitigated and/or offset.

Sunwater acknowledges the Birriah and Jangga peoples — the Traditional Custodians of the land and waters where Burdekin Falls Dam is located.

To date, Sunwater has commenced stakeholder engagement and undertaken a range of field studies including terrestrial ecology, groundwater, geomorphology, social amenity and commenced selected geotechnical and cultural heritage surveys as part of the EIS.

These studies can be progressed based on a two-metre raise.

Upon completion of the EIS (if approved), the DBC will be revisited and, following a Queensland Government investment decision for the project, it is expected that the DBC will be publicly released.

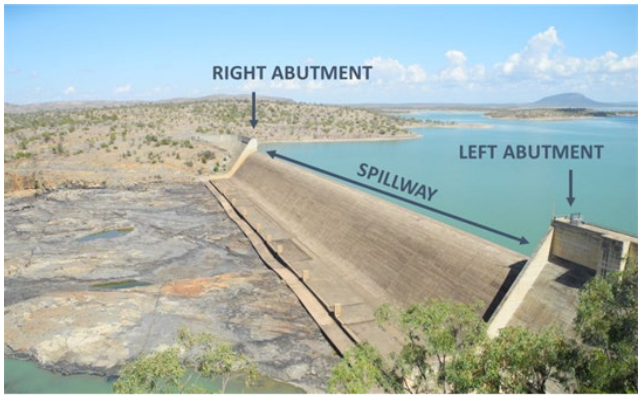
Project works details

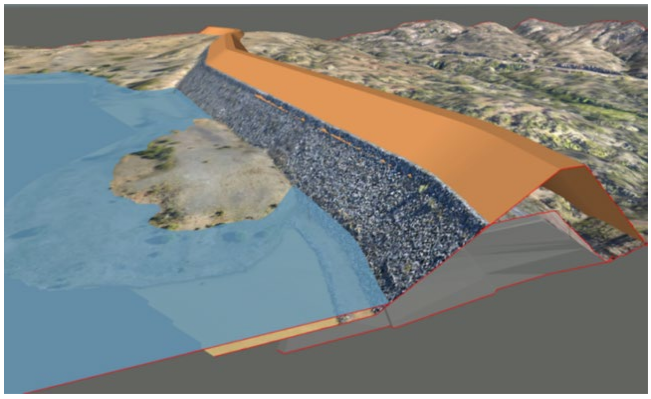
The proposed Burdekin Falls Dam Raising project will involve multiple major work packages to achieve the requirements of the raise and improvement.

The EIS will assess the dam's spillway being raised using mass concrete buttressing to increase the height by two metres, increasing the storage capacity by 574,240 megalitres (ML) or 31 per cent. This would take the total capacity of the dam to an estimated 2,434,240 ML and increase the availability of medium priority water by approximately 150,000 ML per annum.

To account for the increase in spillway height, the dam's left and right abutments – the walls either side of the spillway – are also proposed to be raised.

Preliminary design has commenced and further details of all work components will be refined with ongoing design work and development of construction processes.





Above L-R: Spillway and abutments. Preliminary design – saddle dam raising for illustrative purposes only.

Work on the saddle dams is also proposed with the two Mount Graham Saddle Dams to be raised; the Left Bank and Northern Abutment saddle dams to be amalgamated and raised; and a new Right Bank Saddle Dam will be constructed.

The increased abutment and saddle dam heights are to provide flood resilience up to a probable maximum flood (PMF) event level and to aid in holding the additional water capacity that the spillway raise will provide.

Associated works to support construction will include new water and wastewater treatment plants, resource extraction areas and associated access tracks, road works, worker accommodation camp, helipad, power and telecommunications. Recreation facility upgrades are also proposed.

No significant new water distribution infrastructure is currently proposed as part of the project.

Project rationale and benefits

The dam raising considers the long lifecycle of water infrastructure assets, as well as the important role of water as a key enabler for industries like agriculture, mining, and energy.

Water infrastructure has significant development timeframes, which means investigations need to happen well in advance of water being supplied to capture future opportunities. An independent assessment has demonstrated that projected demand for water in the Burdekin region could exceed the current Burdekin Falls Dam yield by 2031.

The original design of the dam allowed for future increases in storage capacity. The Water Plan (Burdekin Basin) 2007 also includes a strategic reserve volume of 150,000 ML for a future raising of the Burdekin Falls Dam by up to two metres.

Meeting safety requirements

The Queensland Government and the Australian National Committee on Large Dams Inc (ANCOLD) have set guidelines for referrable dams. Although Burdekin Falls Dam continues to operate as it should, improvement works must be undertaken to ensure compliance with these standards

A comprehensive risk assessment identified actions needed to bring BFD in line with modern engineering design and safety standards.

The proposed design solution for the raising with concrete buttressing meets the safety compliance requirements.

Meeting demand requirements

A comprehensive forecast of future water demand to 2050 was undertaken to inform the potential raising height.

The assessment focused on the Burdekin Basin catchment and current Burdekin-Haughton Water Supply Scheme including adjacent areas with the potential to supply water in the future. The approach involved a combination of primary desktop research, drawing on past studies and investigations, consultation with urban, agricultural, and industrial water users, and econometric modelling. The water demand assessment also considered the potential impact climate change could have on demand, particularly in the agricultural sector. Demand modelling considered changes in rainfall and temperature based on weighted average estimates from the Queensland Future Climate Change Datasets.

Further detail on the future water demand will be made available in the EIS.

Why two metres?

There is long-term demand for water in the Burdekin region and an independent assessment found a raise of two metres will address demand under all scenarios.

It is the most efficient option to ensure the water security needed to underpin agriculture, industry, urban water supply, or new and emerging industries, such as hydrogen.

Compared to other height options, a two-metre raise will have minimal environmental, social and cultural heritage impacts, while also providing an opportunity for significant cost savings. A two-metre raise also provides the resilience needed to meet dam safety requirements.

Sunwater owns more than 98 per cent of the additional land required for a two-metre raise and, unlike other height options, it is in line with the strategic reserve volume currently allocated with the Burdekin Basin Water Plan.

Other height options

A preliminary assessment of 14.6 and six metre raising options concluded there would be negative environmental and cultural heritage impacts. Environmental flows which play a critical role in supporting the downstream health of the river and reef ecosystems would be impacted, particularly the higher-level flood flows.

A 14.6 metre raising would inundate a further 69,607 hectares of land while a six-metre raise would inundate a further 28,939 hectares, excluding alternative land uses. The large inundation area would also result in other impacts related to remnant vegetation, threatened plant species, ecological communities and fauna habitat.

In addition, the infrastructure required for the 14.6 metre raise option, without the auxiliary spillway, would be significantly more extensive as it must deal with a higher predicted water level. It would require additional mass concrete on the spillway, more extensive anchoring, and mass concrete buttressing of the abutments.

Workforce

The project workforce would require a variety of skillsets including:

- skilled labourers – such as concreters, form-workers, earthworks, welders
- semi-skilled labourers
- specialist trades – mechanical, electrical, instrumentation control and automation
- equipment operators – such as backhoe, dozer, excavator, scraper, trucks, cranes
- traffic management
- specialist subcontractors – water treatment, sewage treatment, gantry crane, survey, and
- supervisors, management, engineers, administration.

Night shifts would be required for some mass concrete pouring (due to temperature sensitivity of this activity) and to maximise progress between dam spill events. An accommodation camp would be required to support a maximum workforce of approximately 350 people.

Next steps – EIS process

The next stage of planning includes progressing design, collecting more detailed geotechnical information, procurement planning and consulting with key stakeholders and the community.

Sunwater expects to submit a draft of the EIS to the Queensland Coordinator-General (CG) in 2023.

The CG will release the draft EIS for public review and comment once satisfied Sunwater has met the EIS Terms of Reference. During this time, the public and State Government advisory agencies will have the opportunity to review and make submissions on the draft in relation to the assessment of impacts and commitments.

More information about the EIS process and Terms of Reference can be found on the CG's website.

Stakeholder engagement

Sunwater commenced targeted community engagement about options for this project in 2020 and will continue engagement as the EIS progresses.

The Burdekin Falls Dam Community Reference Group was formed in March 2021 to foster consultation and information exchange between Sunwater and community representatives about the project. It includes representation from Traditional Owners, environment groups, local government, local residents and grower groups.

Find out more

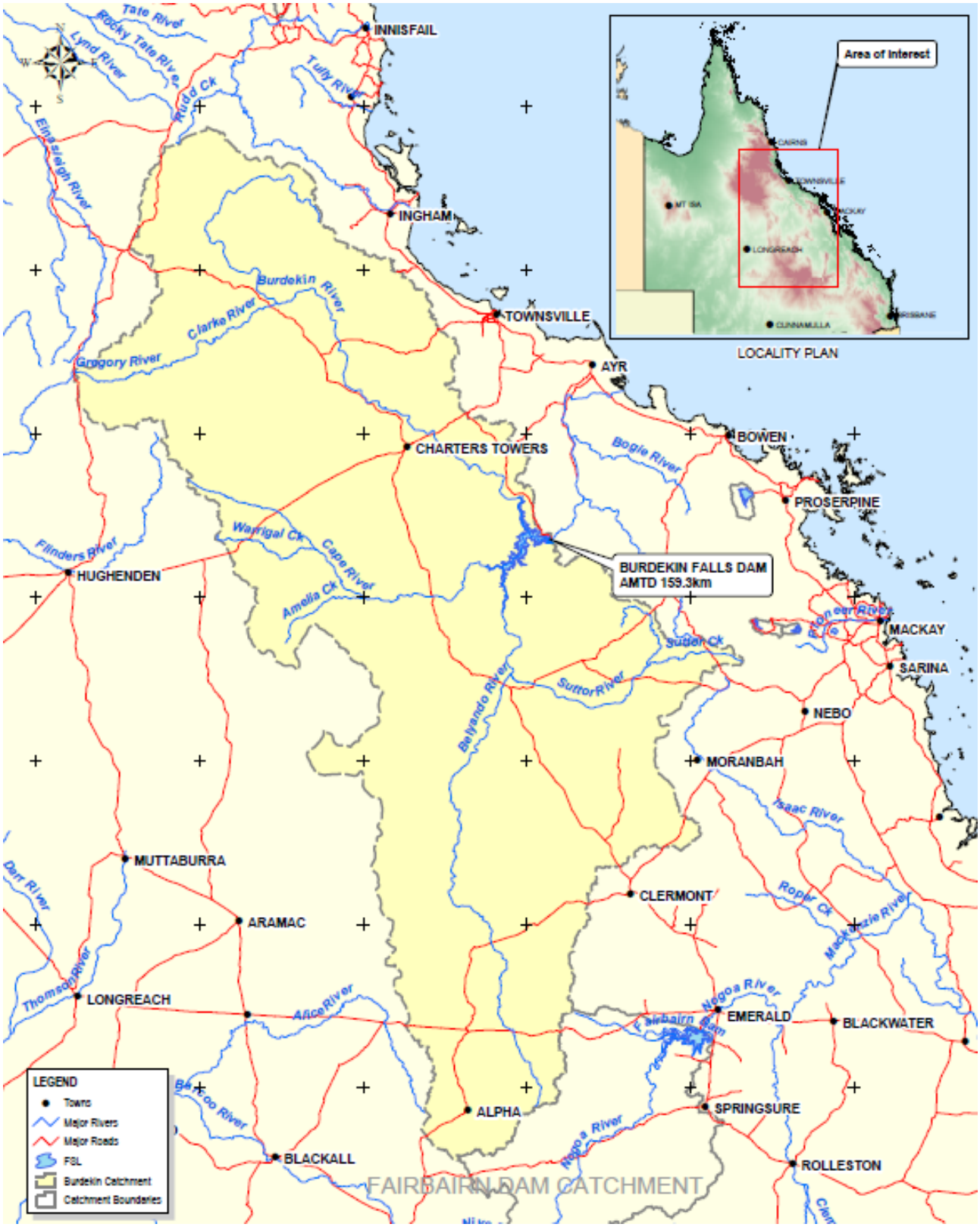
Sunwater is committed to an ongoing dialogue with all interested stakeholders. For more information:

- visit sunwater.com.au/projects/burdekin-falls-dam-raising
- phone 1800 325 145
- email burdekin.projects@sunwater.com.au
- sign up for project updates bit.ly/BFDprojectupdates.

About Burdekin Falls Dam

- Burdekin Falls Dam is the largest dam in Queensland, currently holding 1,860,000 megalitres at full capacity – almost four times the capacity of Sydney Harbour.
- The Birriah and Jangga peoples are the Traditional Custodians of the land and water where the dam is located, approximately 200 km south of Townsville.
- Raising the dam's height by two metres will increase capacity by 31 per cent to 2,434,240 megalitres.
- Construction of the current dam commenced in 1984 and was completed in 1987.
- The current dam wall spans 876 metres, containing the 504-metre spillway.
- The lake where the dam is located is called Lake Dalrymple.
- The dam forms part of the of Burdekin Haughton Water Supply Scheme which irrigates more than 50,000 ha of farmland through 387 km of channels and pipelines and 366 km of drains and supplements the urban and industrial needs of the twin cities of Townsville and Thuringowa.

Location


Area of Interest
LOCALITY PLAN
INNISFAIL
INGHAM
TOWNSVILLE
AYR
BOWEN
CHARTERS TOWERS
PROSERPINE
HUGHENDEN
BURDEKIN FALLS DAM
AMTD 159.3km
MACKAY
SARINA
NEBO
MORANBAH
CLERMONT
MUTTABURRA
ARAMAC
LONGREACH
EMERALD
BLACKWATER
SPRINGSURE
ALPHA
BLACKALL
ROLLESTON
Tate River
Rocky Tate River
Lynd River
Tully River
Ruddd Ck
Elphinstone River
Burdekin River
Clarke River
Gregory River
Bogie River
Flinders River
Warrigal Ck
Cape River
Amelia Ck
Suttor River
Belyando River
Isaac River
Dam River
Thomson River
Alice River
Nogoa River
Mackenzie River
Roper Ck
Barcoo River
FAIRBAIRN DAM CATCHMENT
LEGEND
Towns
Major Rivers
Major Roads
FSL
Burdekin Catchment
Catchment Boundaries