EPBC Act referral

Australian Government
Department of Agriculture, Water and the Environment

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Title of proposal	2020/8705 - Burdekin Falls Dam Raising Project

Section 1

Summary of your proposed action

1.1 Project industry type Water Management and Use

1.2 Provide a detailed description of the proposed action, including all proposed activities

The Project is the raising of the Full Supply Level (FSL) of the existing Burdekin Falls Dam (BFD or the dam) by at least 2 m (to 156 m AHD) and possibly up to 6 m (to 160 m AHD). The final decision as to the level of raising will be made through the Detailed Business Case (DBC) process which will be undertaken coincident with the Environmental Impact Statement (EIS) (if this is the determined assessment process) and will be informed by a thorough stakeholder engagement process. Some ancillary infrastructure will also require upgrade. The additional yield will be available for purchase to a range of customers including urban, mining and agricultural. As is now the case, the dam will be constructed and maintained to meet dam safety standards and Sunwater will operate the dam to comply with the Water Act 2000 (Qld) (Water Act), Water Plan (Burdekin Basin) 2007 (Qld) (Water Plan), Burdekin Haughton Water Supply Scheme (BHWSS) Resource Operations Licence, BHWSS Operations Manual, Burdekin Basin Water Management Protocol 2016 and other relevant legislation.

The proposed works specifically related to the dam site include:

- raising of the spillway by at least 2 m and up to 6 m;
- associated raises of the left and right abutments to contain the selected design flood (Probable Maximum Flood ("PMF");
- raising of the Left Bank and Mt Graham saddle dams to contain the selected design flood;
- construction of a new right bank saddle dam;
- adjustments to apron and splitter piers; and
- roadworks realignment on Right Abutment extension, and roadworks on access road to the dam North of Mount Graham North Saddle Dam and the North Abutment Saddle dam depending on final design and raise height.

In order to undertake those works, the following is required:

- establishment of site offices, storages/stockpile areas, lay down areas – where possible will be located in similar locations as the original works (such as cleared and car park areas around the current recreational facilities);
- re-establishment of construction camp;
- upgraded facilities (water, wastewater and telecommunications);
- re-alignment of the road leading to the right abutment
- re-establishment and establishment of temporary haul roads as required;
- establishment of concrete batching plants;
- if the water storage is at high water levels, temporary lowering of the water level may be required for safety reasons and to access the top of the main spillway; and
- development of material extraction and borrow areas including:
  - re-establishing quarries that were utilised during the original construction of the dam for rock, sand and gravel, all of which are located within approximately 5 km of the dam site; and
  - establishing new quarries for rock, sand and gravel within as short as distance as possible from the dam site as the former quarries are unlikely to be able to supply all the material required;

At the conclusion of the works, the construction camp will be removed, the recreational facilities reinstated and a site rehabilitation program undertaken.

The raised water level will inundate existing land and infrastructure. As a result, the following constitute part of the Project:

- clearing of vegetation from within the increased inundation area (in accordance with a strategy to be developed);
- removal of redundant or otherwise dangerous infrastructure (houses, other buildings, fuel tanks, yards, fences, windmills, powerlines (by the infrastructure owner), etc;
- treatment of contaminated land;
- replacement of Scartwater crossing on the Suttor River;
- replacement and realignment of several rural roads or farm accesses;
- replacement and/or realignment of power supply and telecommunications to farms (by the infrastructure owner); and
- relocating private infrastructure required to support continued use of land not affected by the Project (e.g. existing farm pumps used to access water from the dam).

Throughout the construction phase, exclusion of public access from the vicinity of construction is anticipated. Public access to other parts of the lake area is expected to be restricted only where warranted for public safety.

The requirement for any new water development infrastructure to deliver the additional yield to users is to be determined during the progression of the business case and further decisions being made on the Project within the EIS phase. Any such required infrastructure cannot currently be described.

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The project location and regional context is shown in Figure 1 Project location while Figure 2 shows the surrounding land tenure. Figure 3 provides an overview of the infrastructure within the existing BHWSS. Figure 4 details the project study area, while Figure 5 shows the protected area surrounding the dam.

The coastal marine zones of the Great Barrier Reef Marine Park are shown in Figure 6 Downstream Protected Areas. Further detail of protected matters are provided in the baseline reports.

1.3 What is the extent and location of your proposed action?

See Appendix B

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland)

BFD is located in North Queensland, 210 km by road, south-east of Townsville and 80 km south of the small historic township of Ravenswood. The dam wall is located at latitude 20°38' South and longitude 147°08'East (Project location figure) and at adopted middle thread distance (AMTD) 159.3 km upstream from the river mouth. It was built atop Burdekin Falls and now forms Lake Dalrymple, which covers an area of approximately 28,650 ha at FSL (including 2,879 ha of islands) and ponds water 50 km up the Burdekin River and 70 km upstream on the Belyando-Suttor tributaries of the dam's sub-catchment. The dam is reached by Burdekin Falls Dam Road which joins the Flinders Highway at Mingela. It can also be reached directly from the Lower Burdekin area by the Ayr-Ravenswood road.The inundation area and dam are located within the Charters Towers and Whitsunday Council areas. The downstream areas within the Burdekin and Whitsunday areas. See Burdekin Projects attachment.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

Raising the dam by 2 m would increase the surface area of Lake Dalrymple at FSL (including islands) from 28,650 ha to 34,422 ha and if raised by 6 m to 48,382 ha. The area associated with ancillary infrastructure works is approximately 808 ha (shown in green on project study area map). Resource extraction areas have not yet been defined and are still being investigated. The project study area is shown in Figure 4.

1.7 Proposed action location

Other - The dam is located on Lot 13 MRY51 and adjacent properties that are freehold and leasehold.

1.8 Primary jurisdiction Queensland

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

☐ Yes ☑ No

1.10 Is the proposed action subject to local government planning approval?

☑ Yes ☐ No

1.10.1 Is there a local government area and council contact for the proposal?

☐ Yes ☑ No

1.11 Provide an estimated start and estimated end date for the proposed action

Start Date 01/11/2024
End Date 01/12/2028

1.12 Provide details of the context, planning framework and state and/or local Government requirements

The following Commonwealth and State legislation and policy is relevant to the Project:

- Environment Protection and Biodiversity Conservation Act 1999 (Cth) ("EPBC Act")
- Native Title Act 1993 (Cth) ("NT Act")
- State Development Public Works Organisational Act 1971 (Qld) ("SDPWO Act")
- Aboriginal Cultural Heritage Act 2003 (Qld)

- Environmental Offsets Act 2014 (Qld) ("EO Act")
- Environmental Protection Act 1994 (Qld) ("EP Act")
- Fisheries Act 1994 (Qld) ("Fisheries Act")
- Forestry Act 1959 (Qld)
- Land Act 1994 (Qld)
- Marine Parks Act 2004 (Qld)
- Native Title (Queensland) Act 1993 (Qld)
- Nature Conservation Act 1992 (Qld) ("NC Act")
- Planning Act 2016 (Qld) ("Planning Act")
- Queensland Heritage Act 1992 (Qld)
- Vegetation Management Act 1999 (Qld) ("VM Act")
- Water Act 2000 (Qld) ("Water Act")
- Water Supply (Safety and Reliability) Act 2008 (Qld)
- Reef 2050 Long-term Sustainability Plan ("Reef Plan")

The most relevant legislation is described below:

State Development Public Works Organisational Act 1971 (Qld)

In June 2020, Sunwater submitted an Initial Advice Statement ("IAS") to the Queensland Coordinator General seeking a declaration of the Project as a coordinated project pursuant to the SDPWO Act.

As part of this declaration, Sunwater seeks to utilise the EIS process in accordance with Part 4, subdivision 2 of the SDPWO Act. Sunwater is seeking a bilateral assessment process between the Queensland State Government and Commonwealth Government under the EIS process.

Environmental Offsets Act 2014 (Qld)

The EO Act provides for environmental offsets to counterbalance significant residual impacts of particular activities on particular matters of national, State or local environmental significance and to establish a framework in relation to environmental offsets.

Environmental Protection Act 1994 (Qld)

The purpose of the EP Act is to protect Queensland's environment while allowing for development that improves the total quality of life, now and in the future, in a way that maintains the ecological processes on which life depends.

The EP Act establishes a number of mechanisms to achieve its objectives, including, creating a 'general environmental duty', regulating contaminated land, licencing of Environmentally Relevant Activities ("ERAs") and issuing the Environmental Protection Policies ("EPPs") and Regulations under the EP Act.

The EP Act also regulates some activities in Great Barrier Reef catchments via Chapter 4A. The purpose of this chapter is to—

a) support the outstanding universal value of the Great Barrier Reef for which the reef was inscribed on the World Heritage List; and

b) protect and enhance the biological integrity and diversity of the aquatic ecosystems of the Great Barrier Reef, including –

i. the coral reef, mangrove and seagrass ecosystems of the reef; and

ii. the aquatic ecosystems of the river basins from which water enters the Great Barrier Reef;

c) improve the health and resilience of the aquatic ecosystem of the reef so they are better able to withstand and recover from disturbances.

Under the Chapter, the Queensland Minister for Environment and the Great Barrier Reef, must ensure an environmental protection policy sets an objective to reduce the load of each of the contaminants entering the waters from each river basin in the catchment. The chapter identifies agricultural ERA's and refers to agricultural ERA Standards and "tailored advice" to achieve those standards.

Fisheries Act 1994 (Qld)

Amongst other things, the Fisheries Act establishes a risk hierarchy for waterway barrier works across Queensland and guides the design and assessment process for the implementation of new waterway crossings. Culverts, bridges and other temporary or permanent waterway barrier works that cannot comply with existing self-assessable codes will result in waterway barrier works designs requiring approval from the Department of Agriculture and Fisheries (DAF).

Planning Act 2016 (Qld)

The Planning Act mandates the framework and process for development assessment and the basic requirements for an application. Under the Planning Act, development may be categorised as accepted development, assessable development (code and impact) and prohibited development. Development approval may be required for matters identified in the relevant planning scheme as well as matters of state significance.

Water Act 2000 (Qld)

The Water Act regulates the taking of and interference with water, excavation or placing of fill in a watercourse, for waters recognised as watercourses under the Water Act.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders

The consultation during the PBC focussed on developing awareness of the Project (the "inform" component of engagement), gaining a better understanding of demand for water and establishing the basis upon which ongoing engagement will be recorded.

The following stakeholder engagement activities were undertaken during the development of the PBC:

- "Consultation Manager" was established as the database for the Project.
- Web based information was developed covering all projects underway or planned for the Burdekin Region and launched on the Sunwater website.
- The Sunwater website provided the opportunity for any interested party to make contact for individual consultation purposes.
- Key messages were developed for the Project and used by Sunwater employees.
- Business Queensland and the Department of Natural Resources, Mines and Energy ("DNRME") were engaged through workshops on the PBC process, service need, options and options filtering.
- Shareholding Ministers and key Commonwealth and State agencies were briefed late in the PBC process to inform them of the outcome and next steps.
- Sunwater presentations to existing liaison groups.
- On acceptance by the Sunwater Board, the Sunwater website was updated to reflect the outcome and next steps, including notification of Project contact details.
- Media release.
- Customers were updated at the Burdekin Irrigator Advisory Committee.

As part of confirming the demand for water, Sunwater undertook a Burdekin water sales tender which resulted in offers in excess of the available water. Sunwater has also consulted with Townsville City Council who have retained access to their full 110,000 ML medium priority allocation from the dam.

Sunwater has also developed a North Regional Blueprint. The blueprint prioritisation tool has been applied to compare the relative financial and economic merit of infrastructure initiatives in the Burdekin basin. Using the likely demand scenarios developed (agriculture and mining), BFD raise is Sunwater's preferred supply option for the identified service need.

The primary engagement goal during the EIS is to build and maintain an engagement program that is proactive, transparent and responsive by facilitating two-way communications channels to enable stakeholders and community members feedback to inform the development of the EIS.

This will be achieved through a comprehensive engagement process which focusses on effective and timely information dissemination regarding the Project and EIS process, proactive engagement with interested and affected stakeholders to seek feedback to inform the Project team.

The objectives of the engagement process will be to:

- ensure factual, timely and relevant information is available to stakeholders at all stages of the EIS;
- facilitate two-way communication channels to enable stakeholder and community feedback to be captured throughout the EIS to inform its development;
- ensure the stakeholder and community engagement process supports and enhances ongoing study and Project deliverables;
- minimise Project impacts and maximise the benefits to stakeholders and community whilst using engagement feedback to input to enhance elements of the Project such as design, operation, management and EIS documentation;
- manage the stakeholder and community members expectations of which Project aspects are negotiable and what is non-negotiable/ what is necessary to complete the EIS and ensuing DBC;
- provide a foundation for a long-term relationship between Sunwater, its stakeholders and the community that is based on trust and mutual respect; and
- provide a basis for the majority view of stakeholders and the community to be reflected in Project planning and the EIS.

A Stakeholder Management Plan for both the Project and the Dam Improvement Project has been developed as well as key messages. Sunwater's website has also been updated.

Sunwater has also undertaken targeted engagement with landholders surrounding the dam to update them on the Project status, advise of Sunwater's lodgement of the IAS to the Coordinator General's Office and understand how these landholders wish to be engaged.

To date, engagement with Indigenous stakeholders has been limited to surveys for geotechnical investigations. The development and implementation of a Cultural Heritage Management Plan will be undertaken as part of the impact assessment process.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project

Sunwater prepared a PBC report in late 2018 to identify current and/or ongoing water demand needs in the Burdekin region, and develop and analyse the options that are suitable for addressing any problems or to capture any opportunities.

The PBC included an environmental assessment that considered impacts to the existing environment with respect to planning and land use, topography, geology and soils, water quality, hydrology, flora and fauna, climate, noise and vibration,

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landscape and amenity and cultural heritage. Flora and fauna survey in 2019. Sunwater submitted an IAS to the Queensland Coordinator General seeking a declaration of the Project as a coordinated project pursuant to the SDPWO Act in June 2020. As part of this declaration, Sunwater seeks to utilise the EIS process in accordance with Part 4, subdivision 2 of the SDPWO Act. Sunwater is seeking a bilateral assessment process between the Queensland State Government and Commonwealth Government under the EIS process.

1.15 Is this action part of a staged development (or a component of a larger project)?

☐ Yes ☑ No

1.16 Is the proposed action related to other actions or proposals in the region?

☑ Yes ☐ No

1.16.1 Identify the nature/scope and location of the related action (Including under the relevant legislation)

The project herein referred will satisfy all dam safety related requirements. However for economic and scheduling reasons it may prove prudent for Sunwater to undertake some works related only to dam safety prior to undertaking the raising. This separate project is the Burdekin Falls Dam Improvement Project (DIP) and it is further discussed in Section 8. The current referral assumes there is no separate DIP. BFD is part of the existing Sunwater owned and operated BHWSS. Whilst other projects in the BHWSS are planned (such as converting earth channels to lined channels or pipe, construction or realignment of channels or drains and construction of balancing storages), they are independent from the raising. These represent minor works within the existing scheme and any necessary referrals will be made separately. Any new water supply scheme supporting infrastructure to support the project will be determined during progression of the DBC and further decisions being made during the EIS.

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Section 2

Matters of national environmental significance

2.1 Is the proposed action likely to have any direct or indirect impact on the values of any World Heritage properties?

☑ Yes ☐ No

Property

Great Barrier Reef Marine Park.

Impact

The Burdekin River discharges into the Great Barrier Reef Marine Park approximately 160 km downstream of the dam at Upstart Bay (which is part of the Great barrier Reef World Heritage Area) and is zoned Marine National Park ("no take") and State Marine Park.

Impact to coastal and marine matters of national environmental significance ("MNES") during the construction phase is not considered likely, assuming standard Environmental Management Plan elements are implemented to minimise water quality related impacts. Furthermore, there are three weirs and a significant amount of water extraction between the dam and the coast, minimising water related quality impacts.

The assessment of operational impacts to MNES would likely focus on changes to the downstream flow regime, and water quality. Hydrologic modelling will be required to determine the extent of change and if any mitigation is required.

Indirect or facilitated impacts may arise from use of the additional water made available by the Project, including via increased areas of irrigated land. These aspects will be further assessed during detailed design and the EIS process.

The coastal zones of the Great Barrier Reef Marine Park are shown in Figure 6 Downstream protected areas.

2.1.2 Do you consider this impact to be significant?

☐ Yes ☑ No

2.2 Is the proposed action likely to have any direct or indirect impact on the values of any National Heritage places?

☑ Yes ☐ No

Place

Great Barrier Reef Marine Park

Impact

See section 2.1.

2.2.2 Do you consider this impact to be significant?

☐ Yes ☑ No

2.3 Is the proposed action likely to have any direct or indirect impact on the ecological character of a Ramsar wetland?

☑ Yes ☐ No

Wetland

Bowling Green Bay

Impact

Bowling Green Bay National Park and Ramsar wetland is to the north of the mouth of the Burdekin River.

Impact to coastal and marine MNES during the construction phase is not considered likely, assuming standard EMP elements are implemented to minimise water quality related impacts.

The assessment of operational impacts to MNES would likely focus on changes to the downstream flow regime, and water quality. Hydrologic modelling will be required to determine the extent of change and if any mitigation is required. Further impacts to terrestrial MNES are not anticipated during operations.

Indirect or facilitated impacts may arise from use of the water, including via increased areas of irrigated land. These aspects will be further assessed during detailed design and the EIS process. Bowling Green Bay is shown in Figure 6 Downstream protected areas.

2.3.2 Do you consider this impact to be significant?

☐ Yes ☑ No

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2.4 Is the proposed action likely to have any direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

☑ Yes ☐ No

Species or threatened ecological community

Brigalow (Acacia harpophylla and co-dominant)
Endangered

Impact

Within the Study Area, the Brigalow Dominant and Co-dominant TEC was observed during field survey, consisting of RE 11.3.1 (Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains). In total, 12 sites were recorded within this RE. A total of 19 ha of the brigalow TEC is mapped as being impacted within the 160 m inundation area and <1 ha is mapped within the 156 m inundation contour (Epic, 2019).

The ecosystem has been highly fragmented throughout its range and many of the remnants are poorly preserved and subject to the impacts of weed invasion and cattle grazing.

The Restricted pest plants Cryptostegia grandiflora, Parthenium hysterophorus, Harrisia martini and Jatropha gossypifolia are present in generally low abundance throughout the majority of brigalow habitats sampled.

Species or threatened ecological community

Poplar Box Grassy Woodland on Alluvial Plains
Endangered

Impact

The Burdekin Dam assessment coincides with the far northern limit of Eucalyptus populnea as a species. Eucalyptus populnea was not recorded during the field survey with only a few scattered historic records of the species from the Belyando area. Owing to the sparsity of species records, it is considered unlikely that Eucalyptus populnea would be found in enough density to form representation of the Poplar Box ecological community and therefore the proposed Project is not likely to have a significant impact on the TEC.

Species or threatened ecological community

Semi-evergreen vine tickets of the Brigalow Belt (North and South) and Nandewar Bioregions
Endangered

Impact

The Burdekin River Dam inundation area represents the far northern limit of the TEC which associates with six Regional Ecosystems.

None of these regional ecosystems were recorded during the field assessment. Severe degradation of nearly all habitats associated with Land Zone 11 and Land Zone 3 within the inundation zone due to weed infestation, timber extraction, fire and grazing suggest intact examples of vine thicket are unlikely to occur.

Species or threatened ecological community

Squatter Pigeon (southern subspecies) Geophaps scripta scripta
Vulnerable

Impact

The Project is unlikely to have a significant impact on the Squatter Pigeon.

The squatter pigeon was recorded 59 times at 52 locations during the fauna field survey. The Squatter Pigeon was recorded in five locations within non-remnant vegetation and in at least nine (9) REs, and possibly as many as 15 REs.

The Squatter Pigeon is now largely restricted to Queensland.

In Queensland, the southern subspecies occurs north to the Burdekin River (Frith 1982) with an intergrade zone with the northern subspecies G. s. peninsulae around the Burdekin-Lynd Divide (Crome 1976; Ford 1986; Schodde & Mason 1997). The species extends west to Longreach, Barcaldine and Charleville and east to Townsville, Proserpine, Warwick and Esk (Storr 1973; Frith 1982; Schodde & Mason 1997). It does not appear to undertake any large-scale seasonal movement and is probably locally nomadic, or perhaps sedentary (Pizzey 1980; Frith 1982; Blakers et al. 1984).

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Species or threatened ecological community

Red Goshawk Erythrotriorchis radiatus
Vulnerable

Impact

The Project is unlikely to have a significant impact on the Red Gashawk.
No Red Goshawks were observed in recent field surveys. The closest known record is a 2013 Wildlife Online (WO) record from south of Glenden, approx. 124 km east of the Study Area. The co-ordinates provided are coarse. All the records in the general area are either east of Glenden towards Mackay or around Townsville. In partly cleared habitats in eastern Australia Red Goshawk occurs in areas with gorges and escarpments (Czechura & Hobson 2000). There is suitable habitat in the Study Area, but only below the dam wall.

Species or threatened ecological community

Australian Painted Snipe Rostratula australis
Endangered

Impact

The Project is unlikely to have a significant impact on the Australian Painted Snipe.
No Australian Painted Snipes were observed in recent field surveys. The closest known record is a historical Bird Atlas record (pre 1977) from east of Ravenswood, approx. 46 km north of the Study Area. However, the co-ordinates provided are coarse and the spatial error is 9 km. A nearby record, also historical Bird Atlas, has a spatial error of 54 km. There is a 1986 record from Wambiana south of Charters Towers (ALA 2019), approx. 61 km west of the Study Area. During non-breeding periods this species may be found in a wide range of habitats including dams, waterlogged grasslands and roadside drains (Marchant & Higgins 1993). There is suitable habitat in the Study Area, though any possible occurrence is likely to be highly sporadic and brief.

Species or threatened ecological community

Curlew Sandpiper Calidris ferruginea
Critically endangered, migratory, marine

Impact

The Project is unlikely to have a significant impact on the Curlew Sandpiper.
No Curlew Sandpipers were observed in recent field surveys. The closest known record is a historical Bird Atlas (pre 1977) with a 54 km spatial error. This renders the record largely useless. There is a 1994 WO record from Tooma Lake (ALA 2019), approx. 45 km north from the Study Area. Curlew Sandpiper occurs mostly on intertidal mudflats in sheltered coastal areas but also on non-tidal swamps, lakes and lagoons near the coast. It is recorded on inland waterbodies, though less often (Higgins & Davies 1996). Curlew Sandpiper could occur. However, any occurrence is likely to be very occasional and of short duration, most likely on passage.

Species or threatened ecological community

Black-throated Finch (southern) Poephila cincta cincta
Endangered

Impact

The Project is unlikely to have a significant impact on the Black-throated Finch.
No Black-throated Finches were observed in recent surveys. The closest known record is a First Bird Atlas record (1977 – 1981 Blakers et al. 1984) from within 5 km of the western extremity of the Study Area. This is a ‘sensitive’ subspecies and the spatial error is 9 km. Most of the close records, i.e. <50 km are historical Bird Atlas records or museum specimens from the 19th century and have spatial errors of 9 km or even 54 km (ALA 2019). The subspecies was still present on Anthill Creek, north of Woodstock and approx. 100 km north of the site in 2011 (T. Reis pers. obs.). Black-throated Finches occur in dry open woodlands and forests with seeding grasses and free-standing water. They are often along watercourses (Higgins et al. 2006b). There is suitable habitat in the Study Area.

Species or threatened ecological community

Yakka Skink Egernia rugosa
Vulnerable

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Impact

The Project is unlikely to have a significant impact on the Yakka Skink.
Yakka Skinks were observed in recent field studies. Otherwise the closest known record is a 1980 Queensland Museum) QM specimen from approximately 17 km west of the Study Area. The next closest record is from approximately 180 km to the southwest, no date is provided but it is pre 1996 (ALA 2019). This secretive species occurs in a wide variety of habitats in at least 6 land zones (Wilson 2005; Richardson 2006; BBRW 2010) and may be present.

Species or threatened ecological community

Ornamental Snake Denisonia maculate
Vulnerable

Impact

The Project is unlikely to have a significant impact on the Ornamental Snake.
No Ornamental Snakes were observed in recent field studies. The closest known record is approx. 40 km west of the Study Area. It is a 1965 Australian Museum (AM) specimen. There are a number of records east of the Study Area, the closest of which is an AM specimen from 2004, approx. 57 km to from the Study Area. There are also records around Charters Towers (ALA 2019). This species has very specific soil type and topography requirements (Swan & Wilson 2008). There is some potentially suitable habitat in the Study Area, including 19 ha of RE 11.3.1, however this is composed of 10 discrete patches, possibly reducing the likelihood of occurrence.

Species or threatened ecological community

Koala Phascolarctos cinereus
Vulnerable

Impact

The Project is unlikely to have a significant impact on the Koala.
No Koalas were observed in recent field studies. The closest known record is a WO record from 1986, approximately 25 km west of the Study Area. There is also a record 33 km to the east. The closest known record since 2000 is a 2001 record approximately 40 km to the northwest (ALA 2019). Koalas are most abundant on coastal plains and in foothills but do extend inland along watercourses with Eucalyptus camaldulensis (Martin et al. 2008; Krockenberger et al. 2012). There is suitable habitat in the Study Area, though the paucity of local records suggests any occurrence would be at very low densities and/or very patchy in terms of distribution.

Species or threatened ecological community

Greater Glider Petauroides volans
Vulnerable

Impact

The Project is unlikely to have a significant impact on the Greater Glider.
No Greater Gliders were observed in recent field studies. The closest known record is from north of Collinsville in 2019, approx. 85 km east of the Study Area. Most records in the general area are in the ranges to the west of Proserpine and Mackay to the east or west of Townsville to the north (ALA 2019). The Greater Glider lives in eucalypt-dominated forest and woodland, sheltering in tree hollows (McKay 2008). It occurs patchily with apparently suitable forest often supporting no animals. Defining habitat as suitable needs to be done carefully (Henry 1984). Apparently suitable habitat is present in the Study Area.

Species or threatened ecological community

Waxy Cabbage Palm Livistona lanuginosa
Vulnerable

Impact

Waxy Cabbage Palm Livistona lanuginosa were recorded at 32 locations across the Study Area during recent field survey.
The species is endemic to the Burdekin River basin in the North Kennedy Pastoral District, north-eastern Queensland. It is known to occur only along sandy river and creek channels that flow only for part of the year but with permanent pools or soaks. Recent collections have extended its known range: Lulu Pocket south of Ravenswood is the eastern extension of its range and Doongmabulla on the Carmichael River is the southern limit (DEWHA 2008e). Extensive populations were recorded within the proposed inundation area, generally associated with Cape River, Rollston River, Suttor River and associated

tributaries, as well as populations associated with tributaries of the Burdekin River west of the Burdekin Falls Dam road.
The creation of riparian habitat from fluctuating inundation levels may result in some initial impacts being offset.

Species or threatened ecological community

Black ironbox Eucalyptus raveretiana
Vulnerable

Impact

Black ironbox Eucalyptus raveretiana, were recorded at nine (9) locations across the Study Area during recent field survey.
Black Ironbox occurs between Rockhampton and Ayr in Queensland. The extent of occurrence is about 90 000 km2 (Queensland Herbarium, 2008 cited in DEWHA 2008d). Extensive populations were recorded during field survey on the Burdekin River and associated tributaries on the north-eastern side of Burdekin Dam.
The creation of riparian habitat from fluctuating inundation levels may result in some initial impacts being offset.

Species or threatened ecological community

Bluegrass Dichanthium setosum
Vulnerable

Impact

Bluegrass may occur in the Study Area. The nearest record is a 1990 collection from the west side of Burdekin Falls-Mingela Road, 12 km north of Burdekin Falls (AVH 2019). Dichanthium setosum is associated with heavy basaltic black soils and stony red-brown hardsetting loam with clay subsoil (and is found in moderately disturbed areas such as cleared woodland, grassy roadside remnants, grazed land and highly disturbed pasture (DEWHA 2008c). Suitable habitat within the assessment area.

2.4.2 Do you consider this impact to be significant?

☑ Yes ☐ No

2.5 Is the proposed action likely to have any direct or indirect impact on the members of any listed migratory species or their habitat?

☑ Yes ☐ No

Migratory species

Caspian Tern Hydroprogne caspia
Marine, migratory

Impact

The Caspian Tern was observed at 10 locations in the fauna survey. Caspian Terns occur mostly in sheltered coastal habitats, such as bays, estuaries, harbours and inlets, usually with sandy or muddy margins. They use fresh and saline waterbodies and occur on inland wetlands, especially lakes, and reservoirs and rivers. They also use smaller artificial waterbodies such as sewage ponds and saltworks (Higgins & Davies 1996).
Caspian Tern is partly resident and partly dispersive in Australia (Menkhorst et al. 2017). The species is widespread on the coast and occurs inland in eastern Australia. Breeding is widespread at coastal sites and occurs occasionally inland (Higgins & Davies 1996). Caspian Tern is not numerous but is widespread and conspicuous (Pringle 1987; Menkhorst et al. 2017), generally occurring alone or in small parties (Pringle 1987), though more than 200 have been reported when breeding (Pizzey 1980).

Migratory species

Gull-billed Tern Gelochelidon nilotica
Marine, migratory

Impact

The Gull-billed Tern was observed at two locations in the fauna survey. The Gull-billed Tern is widespread in Australia, with two subspecies, a resident, nomadic breeding population of G. n. macrotarsa and migrant Asian-breeding G. n. affinis. They may prove to be different species. Subspecies affinis is mostly confined to coastal areas from the Gulf of Carpentaria westwards to northern Western Australia (Menkhorst et al. 2017).
Gull-billed Terns prefers shallow wetlands, either fresh or saline, particularly those with mudflats. It occurs on estuaries,

river deltas, lakes, swamps and lagoons, including ephemeral waterbodies. It also uses inundated lands such as saltmarsh, saltpans and claypans, and artificial wetlands such as reservoirs, dams, irrigation channels, bores and sewage ponds. In inland areas it may occur well away water, foraging over grassy plains and even gibber (Higgins & Davies 1996).

Gull-billed Terns breed on large, often ephemeral, inland lakes and swamps. Nests are on low, exposed islands, banks and spits of dry mud, sand or, occasionally, rocks (Pringle 1987; Higgins & Davies 1996). In eastern Australia, all breeding records except for Lake Moondarra near Mt Isa are south of 26oS (Higgins & Davies 1996). No coastal breeding sites are known (Blakers et al. 1984; Pringle 1987).

Migratory species

Fork-tailed Swift Apus pacificus
Marine, migratory

Impact

The Fork-tailed Swift is likely to occur. The closest known record is a historical Bird Atlas record from east of Ravenswood (ALA 2019), approx. 50 km north from the Study Area. In Australia, Fork-tailed Swift is almost exclusively an aerial species, probably even sleeping on the wing. The species is widespread in Australia (Higgins 1999) and will almost certainly occur over the Study Area at times.

Migratory species

Glossy Ibis Plegadis falcinellus
Marine, migratory

Impact

The Glossy Ibis is likely to occur. There is a 2013 record from Airstrip Bay at BFD. There is also a historical Bird Atlas record that appears to be from the dam but it has a spatial error of 54 km and is from the 19th century (ALA 2019). Glossy Ibis occurs in terrestrial wetlands, preferring inland freshwater wetlands with abundant aquatic flora. (Pringle 1985; Marchant & Higgins 1990). The species moves in response to good rainfall (Pringle 1985).

Migratory species

Latham’s Snipe Gallinago hardwickii
Marine, migratory

Impact

Latham’s Snipe may occur. There are 3 records from the 1970s from approx. 22 km west of the Study Area. The closest record post 2000 is a 2016 record from approx. 65 km north of the Study Area (ALA 2019). Latham’s Snipe occurs in a wide variety of permanent and ephemeral wetlands, preferring open freshwater wetlands with fringing vegetation. The species is also recorded from lakes and some artificial waterbodies (Higgins & Davies 1996).

Migratory species

Common Greenshank Tringa nebularia
Marine, migratory

Impact

The Common Greenshank may occur. The closest known record is a 1901 Museums Victoria specimen (ALA 2019), from approx. 35 km east of the Study Area. There are a number of historical Bird Atlas and First Bird Atlas records in the general area. The closest known record post 1981 is from Lake Powlathanga, southwest of Charters Towers in 2008, approx. 91 km to the west. Common Greenshank occurs on a wide variety of coastal habitats and inland wetlands. The species prefers sheltered coastal areas, typically with large mudflats, mangroves and saltmarsh (Lane 1987; Higgins & Davies 1996) but also uses permanent and ephemeral terrestrial wetlands including swamps, dams and inundated floodplains (Higgins & Davies 1996).

Migratory species

Common Sandpiper Actitis hypoleucos
Marine, migratory

Impact

The Common Sandpiper may occur. The closest known record is a 1995 record from the Burdekin River (ALA 2019), approx. 25 km east of the Study Area. Common Sandpiper occurs on a wide variety of coastal and inland wetlands including around dams, billabongs and claypans (Higgins & Davies 1996).

Migratory species

Pectoral Sandpiper Calidris melanotos
Marine, migratory

Impact

The Pectoral Sandpiper may occur. The closest known records are from Home Hill in 2001, approx. 94 km to the north of the Study Area. There are also 2005 and 2007 records from Bowen (ALA 2019), approx. 133 km to the northeast. In Australia, Pectoral Sandpiper mostly occurs on shallow fresh or saline wetlands, using brackish wetlands when freshwater is not available (Higgins & Davies 1996; Menkhorst et al. 2017). The Pectoral Sandpiper associates with Sharp-tailed Sandpiper (Pringle 1987), which has been recorded twice at BFD.

Migratory species

Sharp-tailed Sandpiper Calidris acuminate
Marine, migratory

Impact

The Sharp-tailed Sandpiper is likely to occur. There are two records from Airstrip Bay at BFD, from 2004 and 2005 (ALA 2019). In Australia, the species is widespread in both inland and coastal locations and in both freshwater and saline habitats, preferring muddy edges of shallow fresh or brackish wetlands (Higgins & Davies 1996).

Migratory species

Oriental Cuckoo Cuculus optatus
Migratory

Impact

The Oriental Cuckoo may occur. The closest known record is a historical Bird Atlas (pre 1977) record from east of Ravenswood, approx. 43 km from the Study Area. There is a 2002 record from Collinsville (ALA 2019), approx. 74 km to the east. Oriental Cuckoo is mostly a coastal and subcoastal species but there are occasional records further inland. It occurs in a variety of habitats including open forest and woodland (Blakers et al. 1984; Higgins 1999).

Migratory species

Eastern Osprey Pandion cristatus
Marine, migratory

Impact

The Eastern Osprey is likely to occur. There is a 2002 record from near BFD wall (ALA 2019). Eastern Osprey occurs along the entire Australian coastline and extends far inland, typically along major rivers or on large lakes and reservoirs (Debus 1998).

Migratory species

Rufous Fantail Rhipidura rufifrons
Marine, migratory

Impact

The Rufous Fantail may occur. The closest recent record is from Plum Tree Creek, Burdekin Dam Road in 2000, approx. 20 km west of the Study Area. There are a number of other records in the area, from 1964 to 1979, but all have large spatial errors (ALA 2019). Rufous Fantail mostly occurs in moist habitats, gullies and vine thickets but on passage may occur in other habitats (Menkhorst et al. 2017).

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Migratory species

Black-faced Monarch Monarcha melanopsis
Marine, migratory

Impact

The Black-faced Monarch may occur. The closest known record is a 2018 record from west of Collinsville (ALA 2019), approx. 63 km from the Study Area. Black-faced Monarch prefer moist habitats but can be found in drier habitats during passage (Higgins et al. 2006b).

Migratory species

Satin Flycatcher Myiagra cyanoleuca
Marine, migratory

Impact

The Satin Flycatcher may occur. The closest known record is from Dreghorn Station in 2006 (ALA 2019), approx. 17 km northwest of the Study Area. Satin Flycatcher avoids dry habitats and is virtually confined to the east of the Great Dividing Range (Boles 1988) but very occasionally is recorded further inland (T. Reis pers. obs.). The congeneric Leaden Flycatcher M. rubecula is easily mistaken for Satin Flycatcher and many inland records of Satin Flycatcher probably refer to the much more widespread Leaden Flycatcher.

Migratory species

Salt-water Crocodile Crocodylus porosus
Marine, migratory

Impact

The slat-water crocodile is likely to occur; however, the Project is unlikely to have a significant impact on the Salt-water Crocodile.

No Salt-water Crocodiles were observed in recent field studies. The closest known record is an undated South Australian Museum specimen from the Burdekin River (ALA 2019), approx. 38 km east of the Study Area. The Salt-water Crocodile can occur hundreds of kilometres inland along major drainage systems (Webb et al. 1983; Read et al. 2004). All areas of the Upper Burdekin are considered suitable habitat for the estuarine crocodiles during the wet season. Dry season distribution of the species is likely to be restricted to Lake Dalrymple and other large pool habitats.

2.5.2 Do you consider this impact to be significant?

☐ Yes ☑ No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

☐ Yes ☑ No

2.7 Is the proposed action likely to be taken on or near Commonwealth land?

☐ Yes ☑ No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

☐ Yes ☑ No

2.9 Is the proposed action likely to have any direct or indirect impact on a water resource from coal seam gas or large coal mining development?

☐ Yes ☑ No

2.10 Is the proposed action a nuclear action?

☐ Yes ☑ No

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2.11 Is the proposed action to be taken by a Commonwealth agency?

☐ Yes ☑ No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage place overseas?

☐ Yes ☑ No

2.13 Is the proposed action likely to have any direct or indirect impact on any part of the environment in the Commonwealth marine area?

☑ Yes ☐ No

2.13.1 Describe the nature and extent of the likely impact on the whole of the environment

See Section 2.1.

2.13.2 Do you consider this impact to be significant?

☐ Yes ☑ No

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 3

Description of the project area

3.1 Describe the flora and fauna relevant to the project area

Terrestrial

The Study Area is located mainly within the Cape River Hills subregion of the Brigalow Belt North Bioregion with the northernmost section within the Einasleigh Uplands Bioregion.

In total, 64 families, 166 genera and 271 vascular plant species were identified during the post-wet flora survey, comprising two species listed as Vulnerable under the EPBC Act (Black Ironbox Eucalyptus raveretiana and Waxy Cabbage Palm, Livistona lanuginose), one species listed as Vulnerable under the NC Act, and 44 introduced species including seven species scheduled as Restricted Class three invasive plants under the Biosecurity Act 2014 (Qld) ("Biosecurity Act").

The post-wet/winter fauna survey conducted by Epic Environmental recorded 178 species of terrestrial vertebrate, comprising 35 mammal, 124 bird, 13 reptile and six frog species. This included one species listed as Vulnerable (squatter pigeon) under the EPBC Act and NC Act, two species listed as Migratory (Caspian Tern and Gull-billed Tern) under the EPBC Act and nine introduced species. Combined with previous survey by GHD, the species assemblage would likely be 211 species, comprised of 36 mammal, 148 bird, 16 reptile and 11 frog species.

Aquatic

Aquatic habitat within the Study Area is dominated by Lake Dalrymple. This habitat is mapped as a Wetland of National Significance (Directory of Important Wetlands in Australia, 2020) as it provides an important dry season refuge for species within a catchment prone to drought conditions.

Riverine habitats upstream of the lake support a diversity of aquatic habitat types including permanent pools, runs and riffles. The value of these riverine habitats is, however, influenced by seasonal variability with substantial lengths or river and stream completely dry during the dry season. Connectivity to upstream habitats is limited during the dry season when full supply level of the lake decreases. Wet season flows facilitate longitudinal and lateral migration to floodplains and off-stream waterbodies.

Due to its turbidity, aquatic flora within Lake Dalrymple and the Belyando-Suttor arms is of low diversity and abundance (ACTFR, 1999). In the Lower Burdekin in-river plants are also uncommon, though aquatic weed infestation has been well documented (Davis, Pearson, Kneipp, Benson, & Fernandes, 2015).

All native species of aquatic plant potentially or likely to occur in the Study Area are common, widespread and not listed as threatened. One species of aquatic plant that is recorded from the Burdekin Basin is endemic to Queensland (i.e. Nymphaea vaporalis), and this species possibly occurs in the Study Area.

Nine species of aquatic weeds have the potential to occur in the Study Area, although water hyacinth and Salvinia have not been recorded. Water hyacinth, Salvinia and Hymenachne are listed Restricted Biosecurity Matters. Paragrass is not a biosecurity matter, although it is known to adversely impact the quality of aquatic habitats (DAFF 2012).

The macroinvertebrate communities are relatively diverse. All macroinvertebrate taxa recorded, and all taxa likely to occur in the Study Area, are common and widespread.

Five species of turtle may inhabit the Study Area but only three have been captured in field surveys. None are listed as threatened.

Forty-two native fish species are thought to occur in the catchment and 24 have been captured in recent surveys in and near the Study Area. Several fish species have been stocked within Lake Dalrymple to support recreational fishing values. No fish species in the area is listed under the EPBC Act. BFD is a waterway barrier but its net effect, given it was built atop a significant natural barrier (Burdekin Falls), has been suggested as not significant except with regard to eels(Hydrobiology 2018). A number of other waterway barriers are also present downstream and together these are likely to have influenced the composition of aquatic communities upstream.

While returned from database searches, the freshwater sawfish (Pristis pristis) is not expected to occur upstream of Gorge Weir (downstream from BFD) and to be an uncommon occurrence below it.

Estuarine crocodile, (Crocodylus porosus) may occur and was confirmed present within the Study Area during previous surveys (SKM 2005) and anecdotal evidence during the 2018 survey has indicated their presence within the impoundment.

Platypus (Ornythorhinchus anatinus), listed as Special Least Concern under the NC Act is a possible occurrence though none were observed during the field surveys.

3.2 Describe the hydrology relevant to the project area (including water flows)

The Burdekin Basin is the second largest river basin draining to the GBR lagoon and has the largest mean annual discharge (Clare gauge 1976-2016; 8,327,681 ML; DNRME Water Monitoring Portal June 2017). The Burdekin Basin covers an area of approximately 129,595 km2 and is made up of six major sub-catchments:

- Upper Burdekin
- Cape-Campaspe
- Belyando
- Suttor
- Bowen-Broken-Bogie

- Lower Burdekin

Most rainfall is in summer, with about 80% recorded between December and April. Average annual rainfall varies from 2500 mm at Paluma in the mountains near the coast to about 600 mm at Albro station in the Belyando–Suttor sub-catchment. Flow is strongly seasonal, with a summer wet season, but it is also highly variable and reflects local patterns of rainfall. With a relatively high ratio of mean annual inflow to storage volume, BFD spills commonly during wet season flows. The dam does not have any specific flood control capacity (no gates) but does act to impede flood peaks via the constraint of the spillway and outlet valve capacity. Other than BFD, there are three weirs in the Lower Burdekin sub-catchment (Gorge, Blue Valley and Clare) below the dam with a total storage capacity of nearly 29,000 ML. Charters Towers Weir on the Burdekin River is the only major on-river storage above the dam.

Mitchell et al. (2007) estimate that, on average, approximately 50% of the water exported from the Burdekin mouth is derived from the Upper Burdekin catchment, which drains the western side of the Great Dividing Range within the southern wet tropics area. The other five sub-catchments each contribute around 10% to the total discharge at the end of the Burdekin River.

The Suttor River similarly drains the western side of the Great Dividing Range west of Mackay while the Cape and Belyando systems drain large drier western and southwestern catchments. They have very low gradient and extensive floodplains, with many permanent waterholes scattered through anastomosing river channels.

All but the Bowen-Broken, Bogie and Lower Burdekin enter the Burdekin River above BFD. Water from the Bowen-Broken sub-catchment enters the Lower Burdekin between Gorge Weir and Blue Valley Weir, so flow from these areas is in part available for distribution through the BHWSS. The Bogie River enters downstream of Clare Weir near Millaroo.

The Lower Burdekin, including the Burdekin Delta, is the largest floodplain system on the Australian east coast. It has diverse coastal ecosystems, including significant wetlands that provide important physical, biogeochemical and biological process functions for the GBR World Heritage Area (GBRWHA) (GRBMPA, 2013). It is also highly developed for agriculture.

3.3 Describe the soil and vegetation characteristics relevant to the project area

The inundation area and surrounds are characterised by mostly gently sloping flats and low hills with sparse native vegetation and is predominately used for grazing. The area contains remnant vegetation including areas of Endangered, Of Concern and Least Concern regional ecosystems (“RE”). The dominant vegetation type is eucalypt woodland on alluvial plains.

Vegetation

The Study Area is located entirely within the Cape River Hills subregion of the Brigalow Belt North Bioregion. The bioregion has a variety of vegetation communities, notably open Eucalypt woodlands, native grasslands and vine thickets. Remnant vegetation provides refuge for a variety of flora and fauna species.

Of the 48,382 ha within the 160 m new inundation area (6 m raise), remnant vegetation forms 20,469 ha (42.3%), non-remnant vegetation forms 2,673 ha (5.3%) with a balance of 25,240 ha at FSL (52.2%) forming the current inundation footprint. Of the remnant vegetation, 19 ha of vegetation listed as Endangered under the EPBC Act and the VM Act, 7,724 ha Of Concern vegetation and 12,725 ha Least Concern vegetation.

The integrity of the vegetation communities throughout the Study Area has been affected by anthropogenic activities, as well as natural disturbances such as erosion. Although these disturbances generally only occurred at a localised scale, a diversity of introduced flora species was recorded during the field survey. A number of vegetation communities such as brigalow (Acacia harpophylla) woodland and semi-evergreen vine thickets have been historically intensively cleared throughout the bioregion, as these communities usually occur on fertile soils suitable for agriculture (McDonald 2010; DoEE 2018).

Development in the Lower Burdekin floodplain has extensively modified the coastal ecosystems. Predevelopment floodplain forest and forest coastal ecosystems have been extensively cleared and developed for agriculture. Remnant vegetation in these areas is generally confined to riparian zones, tidally influenced estuary areas, as well as near Cape Upstart National Park. Given the extent of existing development on the coastal plain, the remaining remnant vegetation and wetlands are of high environmental value.

Soils

With reference to the Regional Burdekin River Surface Geology and Regional Bowen Basin Solid Geology at a scale of 1: 500,000, the geology mapping identified the Study Area is underlain by several formations (QG 2019a). The most predominant geology in the Study Area includes:

- Star of Hope Formation (Cs), comprising lithic conglomerate, feldspatholithic sandstone, rhyolitic to dacitic ignimbrite and flows, tuffaceous siltstone and rare sinter from the Early Carboniferous Period;
- Scartwater Formation (Cw), comprising mudstone, quartzose to feldspathic sublabile sandstone, limestone, tuff, conglomerate from the Early Carboniferous Period;
- QA-QLD (Qa), comprising clay, silt, sand and gravel; flood-plain alluvium from the Quaternary Period; and
- Qn-BUR (Qn), comprising semi-consolidated clayey sandstone, ferruginous sandstone, sandy claystone, pebble conglomerate from the Quaternary Period.

With reference to Atlas of Australian Soils (QG 2019a), the predominant soil type across the Study Area include:

- Shallow bleached loams (Fu17) and black self-mulching cracking clays (Kb26) on the northeastern portion of the Study Area; and

- Hard pedal yellow duplex soils (SI22) and hard pedal mottled-yellow duplex soils (Va58) on the southwestern portion of the Study Area.

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area

There are no outstanding natural features relevant to the directly impacted areas. There are no National Parks, State Forests or environmental reserves of national or state environmental significance. There are areas of Endangered and Of Concern regional ecosystems including Commonwealth listed endangered TEC Brigalow (Acacia harpophylla).

The downstream areas, which may be indirectly impacted, contain some outstanding natural features and other important and unique values. The areas downstream of the dam encompass the Lower Burdekin Catchment, the Burdekin Delta and the marine environment (Downstream Protected Areas Figure). There are several areas of national and state environmental significance in these areas including:

- High ecological significance wetlands (MSES);
- Ramsar Wetland (MNES);
- Great Barrier Reef World Heritage Area (MNES);
- State Marine Park;
- Declared fish habitat area (MSES); and
- Wildlife habitat – dugong (MSES).

The Lower Burdekin has diverse coastal ecosystems, including significant wetlands that provide important physical, biogeochemical and biological process functions for the GBRWHA (GBRMPA, 2013). The freshwater and estuarine wetlands of the Lower Burdekin are reported to provide food resources and an essential habitat in the lifecycle of up to 70 % of local marine fishery resources (Veitch and Sawynok, 2005).

The Burdekin Delta contains significant wetlands including wetlands of high ecological significance at the mouth of the Burdekin River, and the Bowling Green Bay National Park and Ramsar wetland to the north of the Burdekin River. The Burdekin region wetlands provide habitat for internationally and nationally important shorebirds, waterbirds, waders and seabirds particularly in the vicinity of the Bowling Green Bay Ramsar wetlands (WQIP, 2016). There are 224 bird species known to occur in Bowling Green Bay, 103 are known to breed within the site and at least 19 roosts have been identified. Approximately 30 species are listed under several international agreements (JAMBA, CAMBA and ROKAMBA) and the Bonn Convention (WQIP, 2016).

The Burdekin River discharges into the GBRMP at Upstart Bay approximately 160 km downstream of the dam. Upstart Bay is part of the GBRWHA and is zoned Marine National Park ("no take"), and State Marine Park. It is a declared Fish Habitat Area and provides essential habitat for the dugong (special least concern under the NC Act, marine and migratory under the EPBC Act). Upstart Bay primarily consists of low-lying soft-sediment environments, including seagrass meadows. Seagrasses are an important ecosystem within the Burdekin Region supporting populations of dugong, turtle, seabirds and fisheries of commercial and recreational importance (WQIP, 2016).

3.5 Describe the status of native vegetation relevant to the project area

In total, 32 REs were verified within the 160 m projected inundation contour (6 m dam raise) including a 100 m buffer for mapping purposes). Of these, one RE has VM Status and Biodiversity Status of Endangered (RE 11.3.1). This equates to the Brigalow Dominant and Co-dominant TEC (Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains). In total, 12 Sites were recorded within this RE. A total of 19 ha of the brigalow TEC is mapped as being impacted within the 160 m inundation area and <1 ha is mapped within the 156 m inundation contour (representing a 2 m raise).

Five REs are listed as Of Concern under the VM Act (RE 9.3.23, 11.3.3, 11.3.36, 11.11.10 and 11.11.13, area of 7,724 ha within the 160 m inundation area) and 11 REs have an Of Concern Biodiversity Status. The greatest extent of any RE were the Of Concern REs 11.3.3 (4,812 ha) and RE 11.11.10 (2,876 ha).

Within the 160 m Study Area, 12,725 ha of Least Concern vegetation has been mapped.

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area

The landscape in the region varies substantially, with coastal floodplains, low lying hills and mountain ranges that extend westwards into undulating plains, escarpments, dissected plateaus and inland mesas (NQ Dry Tropics, 2016).

There is considerable variation in the topography, geology and soils upstream and downstream of BFD. In the vicinity of the dam, there is an igneous rock bed at approximately 160 m AHD elevation that is surrounded by mountain ranges that are up to 250 m AHD high. The area around Lake Dalrymple is characterised by mostly gently sloping flats and low hills. Downstream of the dam is undulating terrain that reaches 100 m elevation and is primarily alluvium.

In the upstream section of the Study Area, mapped floodplains are restricted along the river channel of the Burdekin River and to a lesser extent along the Sellheim River, but are typically broader along the Cape and Suttor Rivers. Immediately downstream of the dam, the Burdekin River flows through a confined gorge, with narrow floodplains evident downstream of Gorge Weir and more extensive floodplains further downstream near Clare.

3.7 Describe the current condition of the environment relevant to the project area

The integrity of the vegetation communities throughout the Study Area has been affected by anthropogenic activities, as

well as natural disturbances such as erosion. Although these disturbances generally only occurred at a localised scale, a diversity of introduced flora species was recorded during the field survey.

Of the 44 exotic flora species recorded during the field survey, seven are listed under Schedule 2 of the Biosecurity Act as Category 3 'Restricted Matters', meaning a person must not distribute the invasive plant either by sale or gift, release it into the environment. Nine species of feral animal were recorded during the post-wet field survey (Epic), with an additional three species recorded by GHD (2019) (Table 10). Of these species, four are listed under Schedule 2 of the Biosecurity Act as 'Restricted Matters'.

The downstream areas contain relatively few regional ecosystems and are dominated by non-remnant vegetation. Remnant vegetation in these areas is generally confined to riparian zones, tidally influenced estuary areas, as well as near Cape Upstart National Park. Most of the remaining area is used for agricultural purposes and does not contain remnant native vegetation communities. Development in the Lower Burdekin floodplain has extensively modified the coastal ecosystems. Predevelopment floodplain and coastal ecosystems have been extensively cleared and developed for agriculture. Given the extent of existing development on the coastal plain, the remaining remnant vegetation and wetlands are of high environmental value.

3.8 Describe any Commonwealth Heritage places or other places recognised as having heritage values relevant to the project

There are no listed local, Queensland or National heritage places in the vicinity of the existing dam or extent of proposed inundation. However, there is potential for places such as homesteads and associated infrastructure to have historic heritage value in the vicinity of the existing dam and extent of the proposed inundation. Downstream of the existing dam and in the Lower Burdekin, there are some Queensland heritage places. These are primarily associated with towns and will not be impacted by the raising of the dam.

3.9 Describe any Indigenous heritage values relevant to the project area

There are no places of Aboriginal cultural heritage recorded on the Cultural Heritage Database and Register within the inundation area of the proposed 6 m raising. Forty places are recorded in the greater area surrounding Lake Dalrymple. These places are primarily to the east of the existing inundation area and near the Suttor River, and comprise artefact scatters, scarred/carved trees, isolated finds, a well, a quarry, a hearth/oven, and a stone arrangement (Converge, 2018). There is also potential for Aboriginal cultural heritage to be associated with mature and/or remnant vegetation and water sources such as creeks, rivers, billabongs, lakes and springs.

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area

Most land adjacent to BFD and Lake Dalrymple is freehold land owned by Sunwater (Lot 13 MRY51, 10 MRY33, 14 MRY52). For a 2 m raising some 5,772 ha of land will be newly inundated but only 386 ha of this is beyond Sunwater's current land ownership and will require purchase or the taking of an easement for the flood margin. For a 6 m raising this latter number increases to approximately 1,949 ha. The number of properties affected by this tenure change is approximately 4 and 12 for each level of raising respectively.

The land required for the raising outside of that already owned by Sunwater is generally lands lease.

3.11 Describe any existing or any proposed uses relevant to the project area

The primary land use in the area surrounding BFD is free-range cattle grazing on native pastures, including in the flood margin. Grazing in sub-catchments above the dam often occupies over 80% of the land area. Sunwater recreation and camping facilities are present at the dam, including wood BBQs, picnic tables / shelters, toilets and showers, and a boat ramp. Lake Dalrymple is open to all boating activities and has been stocked with various fish species to support recreation.

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Section 4

Measures to avoid or reduce impacts

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action

Environmental management measures to avoid and reduce impacts will be implemented for all phases of the Project from planning through construction to operation. Environmental management plans (EMPs) will be developed as part of the Project' s assessment and approvals phase. The Planning Phase will attempt to avoid impacts through design wherever possible. This will include responding to feedback through the consultation process. As part of the Construction Phase of the Project a Construction Environmental Management Plan (CEMP) will be developed and will form an important management tool for the Project's impacts and mitigation measures. The CEMP will incorporate environmental and social mitigation measures from the impact assessment and conditions of approval as a framework for the ongoing management, monitoring, reporting and improvement during construction. Its primary purpose will be to detail measures to manage the risk of potential adverse impacts to the previously identified environmental values. For each value, the CEMP will outline the following:

environmental protection objectives, performance outcomes, management controls, monitoring programs, reporting processes, and corrective actions.The Operations Phase will be governed primarily through obligations on Sunwater as the owner of the infrastructure and Resource Operations Licence holder under the Water Act 2000 (Qld) and Water Supply (Safety and Reliability) Act 2008 (Qld), as they are now. This includes ensuring the dam continues to meet dam safety criteria and supply objectives related to water allocation security and environmental flow are met.

Land. Earthworks related to the Project will require an Erosion and Sediment Control Plan (ESCP) which will be a sub-plan of the CEMP. The ESCP will be consistent with current best practice for construction projects and align with guidelines such as IECA Best Practice Erosion and Sediment Control documents. Impacts on environmental values of land (soils and geology) are not expected to be a material issue during construction.

Hydrology. The dam is expected to remain operational during construction and will meet Water Allocation Security Objectives (WASO) and Environmental Flow Objectives (EFO) as specified in the Water Plan. Management during the operations phase will continue to comply with the Water Plan and associated documents.

Groundwater. Groundwater issues are not envisaged at the dam or inundation area, however further analysis will be required. Any further use of surface water in the Lower Burdekin will be partly informed by the outcomes of the groundwater investigations in the Lower Burdekin being undertaken in collaboration with DNRME.

Water quality. During construction the ESCP will aim to prevent release of contaminants (primarily sediment) into the Burdekin River. Other relevant management measures will relate to rapid rehabilitation of disturbed areas, correct storage and handling of chemicals, fuels, oils etc. and spill response procedures. Monitoring of water quality in the works area and downstream will be required and responses made as necessary to ensure water quality objectives are achieved.The effects of the raised BFD and the subsequent increase in the impounded area of water on water quality will require assessment during the EIS.

Terrestrial ecology. A clearing plan will be established to manage any vegetation clearing undertaken and will include requirements for fauna relocation. Sunwater currently holds a Damage Mitigation Permit (Nature Conservation (Administration) Regulation 2017 (Qld)) which allows relocation of wildlife from dangerous situations. It is also likely that professional fauna "spotter-catchers" will be employed during any vegetation clearing associated with construction.

Aquatic ecology. The EMP will address any actions possible to mitigate impacts and enhance positive outcomes within the storage and downstream. This sometimes includes not clearing vegetation near the new FSL to provide habitat for aquatic fauna and to provide stability for the shoreline. Sunwater holds a General Fisheries Permit (Fisheries Act 1994 (Qld)) which allows fish salvage and relocation if necessary.

Cultural heritage. Liaison with the relevant Aboriginal parties will determine the requirement and type of cultural heritage management to be implemented on this Project. A Cultural Heritage Management Plan (CHM") or agreement will be required, including consultation and any field investigation and monitoring necessary with the involvement of the relevant Aboriginal Party. Any activities that may cause ground disturbance will need to comply with the Duty of Care Guidelines. A non-indigenous heritage survey will be required and any management actions will be determined based on the results of the survey.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved

The environmental outcomes sought for the Project are:

- Avoid or minimise potential impacts to MNES throughout the Planning, Design and Construction Phases.
- Offset any significant residual impacts to MNES that cannot be mitigated.
- Maintain operations of BFD during construction to meet EFO requirements.
- Operate the raised dam to meet all legislated environmental requirements and avoid or minimise impacts to MNES.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 5

Conclusion on the likelihood of significant impacts

5.1 You indicated the below ticked items to be of significant impact and therefore you consider the action to be a controlled action

- ☐ World Heritage properties
- ☐ National Heritage places
- ☐ Wetlands of international importance (declared Ramsar wetlands)
- ☑ Listed threatened species or any threatened ecological community
- ☐ Listed migratory species
- ☐ Marine environment outside Commonwealth marine areas
- ☐ Protection of the environment from actions involving Commonwealth land
- ☐ Great Barrier Reef Marine Park
- ☐ A water resource, in relation to coal seam gas development and large coal mining development
- ☐ Protection of the environment from nuclear actions
- ☐ Protection of the environment from Commonwealth actions
- ☐ Commonwealth Heritage places overseas
- ☐ Commonwealth marine areas

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action

Not applicable.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 6

Environmental record of the person proposing to take the action

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Explain in further detail

Sunwater is the proposed Project owner, owner and operator of BFD and the Resource Operations Licence holder for the BHWSS. Through the Government Owned Corporations Act 1993 (Qld) (GOC Act) Sunwater was established in October 2000 to own, operate and facilitate development of bulk water supply infrastructure throughout Queensland (with the exception of South-East Queensland). Sunwater has been the proponent for several projects that were controlled actions in the past including Nathan Dam and Pipelines Project, Connors River Dam and Pipelines Project, Lower Fitzroy River Infrastructure Project, and Woleebee Creek to Glebe Weir Pipeline Project, which all received State and Commonwealth approval. Sunwater maintains a certified Environmental Management System to meet the requirements of ISO 14001. Sunwater provides adequate financial, human and educational resources to support good environmental management. Sunwater complies with all relevant environmental management legislation.

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application

In 2008 the Wide Bay Burnett Conservation Council Incorporated, initiated proceedings in the Federal Court against one of Sunwater's subsidiary companies Burnett Water Pty. Ltd., alleging it had breached a condition of the EPBC Act approval for the construction and operation of Paradise Dam. Judgment in favour of Burnett Water Pty. Ltd. was handed down on 4 March 2011.

Prior to the above judgment, in 2007 an audit conducted by the then Department of Sustainability, Environment, Water, Populations and Communities (SEWPaC) found Burnett Water Pty. Ltd.'s operation of Paradise Dam to be partially non-compliant against a condition of approval under the EPBC Act. Following the handing down of the above judgment, SEWPaC issued an addendum to the Final Compliance Audit Report. The addendum refers to the above judgement and the finding that periods of non-operation of the fishway did not constitute a breach of the EPBC Act approval.

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

☑ Yes ☐ No

6.3.1 If the person taking the action is a corporation, provide details of the corporation's environmental policy and planning framework

At Sunwater, we're focused on minimising our impact on the environment.

We aim to:

•optimise project management and operational procedures that minimise Sunwater's ecological footprint and to ensure full compliance with environmental legislation

•minimise Sunwater's impacts on native fish populations and prevent the spread of pest fish

•proactively manage weeds on Sunwater owned and managed property and investigate alternate, more sustainable methods of weed control.

Our Environmental Commitment is incorporated in how we work, 365 days a year.

We Value People

•Providing ongoing environmental awareness training and support for employees

•Maintaining effective communication with our employees and other stakeholders, such as customers and visitors to our recreation areas, to ensure all environmental management practices are followed.

We Work Together

•Continuously improving our environmental management by setting measurable goals, monitoring, reporting and reviewing the effectiveness of the management system

•Actively engaging with natural resource management groups and government agencies to achieve good environmental outcomes by preventing pollution or serious environmental harm.

We Take Responsibility

•Minimising the potential for adverse impacts from our activities on the environment and requiring our contractors to do the same

•Seeking to identify other ways of improving our environment performance e.g. through innovation and application of new methods

•Setting achievable environmental targets and reporting against these.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Our Environmental Policy

Our Environmental Policy is a roadmap for the future direction of Sunwater as an environmentally aware organisation. In conjunction with our staff code of conduct and corporate objectives, this policy guides our business operations in the way we meet statutory obligations, our own corporate goals and progress on sustainable practices.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

☑ Yes ☐ No

6.4.1 EPBC Act No and/or Name of Proposal

- 2016/7789 - SunWater Limited/Water Management and Use/Boondooma Dam Road, Proston, Qld/Queensland/Boondooma Dam Spillway Repair Project, Qld
- 2012/6416 - SunWater Limited/Water management and use/Township of Nebo/QLD/Nebo Town Water Supply Pipeline
- 2012/6257 - SunWater Ltd/Water management and use/Goonyella Road /QLD/Moranbah to Alpha Pipeline Project
- 2011/6181 - SUNWATER LIMITED/Water Management and Use/Jackson-Wandoan Road to Nathan Road, Taroom/Queensland/Reedy Creek to Glebe Weir Pipeline Project
- 2011/6000 - SunWater Limited/Water Management and Use/Tara-Chinchilla Road to Weir Lane Road/Queensland/Chinchilla Weir Discharge and Pipeline Project
- 2009/5173 - Gladstone Area Water Board and SunWater Limited/Water Management and Use/Lower Fitzroy-Mackenzie Catchment/Queensland/Lower Fitzroy River Infrastructure Project
- 2009/4898 - SunWater/Natural Resources Management/Mt Rose Station, approx 45km north-east of Taroom/Queensland/Translocation Trial for the Boggomoss Snail
- 2008/4429 - SunWater/Water Management and Use/Mt Bridget, Fitzroy River Basin, Central QLD/Queensland/Construct and Operate the Connors River Dam and Pipelines
- 2008/4313 - SunWater/Water Management and Use/Dawson River 75km downstream of Taroom/Queensland/Construction and operation of Nathan Dam and associated water delivery infrastructure
- 2007/3283 - SunWater/Water management and Use/Reed Beds Road, Burdekin Shire/QLD/extension of the existing Reed Beds Pipeline
- 2006/3106 - SunWater/Water Management and Use/Goondicum/Queensland/Water Pipeline
- 2006/2595 - SunWater/Water transport/Moranbah/QLD/Water pipeline
- 2006/2527 - SunWater/Water management and use/Claire Weir - Bowen/QLD/Water for Bowen Project
- 2005/2209 - SunWater/Water management and use/Gorge Weir to Moranbah/QLD/Construction of Burdekin Pipeline

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 7

Information sources

Reference source

ACTFR. (1999). An initial environmental assessment of water infrastructure options in the Burdekin Catchment - Final Report. Queensland: Australian Centre for Tropical Freshwater Research for the Department of Natural Resources - Regional Infrastructure Development Program, North Region.

Reliability

Moderate

Uncertainties

Aged but thorough desktop assessment supplemented by limited field data.

Reference source

Bristow, K., Charlesworth, P., Narayan, K., Stewart, L., Cook, F., & Hopmans, J. (2003). A Framework for Improving Water Management in the Lower Burdekin. Working paper as part of 'Sustainable Management of Burdekin Delta Grounwater Systems'. Australia: CSIRO Land and Water.

Reliability

High

Uncertainties

Somewhat outdated but still relevant to topic

Reference source

Building Queensland. (2016). Business Case Development Framework: Cost Benefit Analysis Guide. Queensland Government.

Reliability

High

Uncertainties

None

Reference source

Commonwealth of Australia, 2018. 'Reef 2050 Long-Term Sustainability Plan - July 2018. Commonwealth of Australia.

Reliability

High

Uncertainties

None

Reference source

Converge. (2018). Burdekin Falls Dam Upgrade: Initial Appraisal. Cultural Heritage and Native Title Assessment. Brisbane: Prepared by Converge Heritage and Community for Ecology Management / SunWater

Reliability

Moderate

Uncertainties

High level assessment only

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Reference source

Davis, A., Pearson, R., Kneipp, I., Benson, L., & Fernandes, L. (2015). Spatiotemporal variability and environmental determinants of invertebrate assemblage structure in an Australian dry-tropical river. Freshwater Science, 34, 634-647.

Reliability

High

Uncertainties

The field data is old but still likely to be representative

Reference source

Deemer, B., Harrison, J., Li, S., Beaulieu, J., DelSontro, T., Barros, N., & Vonk, J. (2016). Greehnhouse gas emissions from reservoir water surfaces: a new global synthesis. BioScience, 66(11), 949-964.

Reliability

High

Uncertainties

None

Reference source

DNRM. (2017). Lower Burdekin Groundwater Strategy Project - Discussion Paper, August 2017. Queensland: Department of Natural Resources and Mines.

Reliability

High

Uncertainties

A high-level discussion paper

Reference source

Droop, O. (2018). Environmental Flow Objectives under Burdekin Falls Dam Raising Scenarios. Brisbane: Prepared by OD Hydrology for Ecology Management.

Reliability

High

Uncertainties

None

Reference source

Ecowise Environmental (2009), Sunwater Burdekin Dam Raising Project: Postwet Season Aquatic Flora and Fauna Component, September 2009, Ecowise Environmental Pty Ltd

Reliability

High

Uncertainties

More recent data is available

Reference source

Frc environment (2019) Burdekin Falls Dam Aquatic Ecology Post-Wet baseline Survey.

Reliability

High

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Uncertainties

None

Reference source

GRBMPA. (2013). Coastal Ecosystems Management - Case Study: Water Management. Townsville: Great Barrier Reef Marine Park Authority

Reliability

High

Uncertainties

None

Reference source

Hart, M., & Broit, A. (2018). Preliminary Medium Priority Yield Assessment. Draft Report for Burdekin Falls Dam Raising Project. Brisbane: SunWater.

Reliability

High

Uncertainties

Noted as preliminary

Reference source

Mitchell, A., Lewis, S., Brodie, J., Bainbridge, Z., & Maughan, M. (2007). Water quality issues in the Burdekin Region. ACTFR Report 07/03 for the Burdekin Water Quality Improvement Program. Townsville: Australiain Centre for Tropical Research, James Cook University.

Reliability

High

Uncertainties

Somewhat dated and more recent data and interpretations are available

Reference source

Newham, M., Moss, A., Moulton, D., & Thames, D. (2017). Draft environmental values and water quality guidelines: Burdekin Basin fresh and estuarine waters (draft March 2017). Queensland: Department of Science, Information Technology and Innovation.

Reliability

High

Uncertainties

Limited by lack of data in some cases

Reference source

NQ Dry Tropics. (2016). Burdekin Dry Tropics Natural Resource Management Plan 2016-2026. Townsville: North Queensland Dry Tropics.

Reliability

High

Uncertainties

None

Reference source

NQ Dry Tropics. (2016). Burdekin Region Water Quality Improvement Plan. Townsville: NQ Dry Tropics.

Reliability

High

Uncertainties

None

Reference source

NQ Dry Tropics. (2016). Burdekin Region Water Quality Improvement Plan 2016 Catchment Atlas. Townsville: NQ Dry Tropics

Reliability

High

Uncertainties

None

Reference source

Parsons Brinckerhoff. (2009). Water for Bowen Environmental Impact Statement - Volume 1. Queensland: SunWater

Reliability

High

Uncertainties

None

Reference source

Pusey, B., Arthington, A., & Read, M. (1998). Freshwater fishes of Australia: biogeography, history and spatial variation in structure. Environmental Biology of Fishes, 8, 303-318.

Reliability

High

Uncertainties

More recent data are available

Reference source

Smith, R. (2018). Opinion: Natural Fish Passage at Burdekin Falls. Brisbane: Expert opnion report prepared by Hydrobiology for Ecology Management / SunWater.

Reliability

High

Uncertainties

None

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Reference source

Veitch, V., & Sawynok, B. (2005). Freshwater wetlands and fish: importance of freshwater wetlands to marine fish resources in the Great Barrier Reef. Townsville: Great Barrier Reef Marine Park Authority.

Reliability

High

Uncertainties

More recent data are available

Reference source

ViPac. (2011). Burdekin Falls Dam Hydro Power Station, Noise Impact Assessment. Queensland: ViPac Engineers and Scientists Ltd. in GHD Preliminary Report.

Reliability

High

Uncertainties

Specifically relates to a project which is no longer relevant, but the site is BFD

Reference source

Webb, A. (2007). Status of non-native freshwater fishes in tropical northern Queensland, including establishment success, rates of spread, range and introduction pathways. Journal and Proceedings of the Royal Society of New South Wales, 140, 63-78.

Reliability

High

Uncertainties

More recent data are available but a relevant summary

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 8

Proposed alternatives

Do you have any feasible alternatives to taking the proposed action?

☑ Yes ☐ No

8.0 Provide a description of the feasible alternative

As noted in Section 1.16, Sunwater is undertaking a DBC for the Burdekin Falls Dam Improvement Project (DIP). Options being assessed include sub-elements of the Dam raising construction activities. The DIP is seeking to improve the dam's ability to pass larger flood events. Therefore, the design response to overcome the increased demands on the dam structure are the same between both projects, however smaller for the DIP, to which a slightly different design solution is being assessed. It is discussed in this section because while it is not an alternative to raising the dam, it would result in alternative approaches to engineering design. Irrespective of the Project and whether it proceeds, Sunwater must complete the DIP to ensure that the life safety risks are below the limit of tolerability as soon as reasonably practical, and in any event before 2035 in order to comply with State Government Policy. As such, it is important that any works required in relation to dam safety and undertaken as part of separate DIP, are not constrained by being regarded as part of the dam raising project. The separate DIP would essentially be a large scale maintenance project which sought to improve the dam's ability to safely pass larger flood events.

The material differences between the Dam Improvement Project and the Dam Raise Project are:

- The Dam Improvement Project does not require raising of the Primary Spillway (no increased inundation impact).
- Installation of post-tensioned anchors to the main dam would be required, which is an activity not otherwise required for the Dam Raise Project (not required for raising).;
- Saddle dams would require raising but to lower levels then required for the Dam Raise Project (reduced disturbance footprint and material demand).;
- Construction of a new Right Bank Saddle dam would be required, however to a lower height then required for the Dam Raise Project (Reduced disturbance footprint and material demand).;
- Downstream buttressing of the main dam abutments to a lesser thickness then required for the Dam Raise Project (Reduced material demand).;
- Smaller construction workforce (reduced office and accommodation requirement).;

Hence relative to the raising project, the DIP:

- Would not increase the storage capacity or yield of the dam.
- Would not increase the inundation area .
- Would not lead to a change in the flow regime downstream.
- Would not alter customers or means of supply to customers.
- Only potentially has impacts related to construction as it does not alter day to day operations.,

To reiterate, the project being referred is a raising of Burdekin Falls Dam which will satisfy all dam safety related requirements. The DIP only becomes a related project if, through the DBC process, it is determined that the DIP should be progressed separately and prior to the dam raise. If this were to be the preferred approach, Sunwater would consider submitting a referral to DAWE in relation to the DIP.

8.1 Select the relevant alternatives related to your proposed action

☑ Timeframes
☐ Locations
☑ Activities

8.2 Provide an estimated start and estimated end date for the proposed alternative action

Start Date	01/11/2024
End Date	01/09/2028

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

8.9 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders

Same as the proposed Project.

8.10 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project

Same as the proposed Project.

8.12 Nominate any matters of National Environmental Significance that are likely to be impacted by this alternative proposal by ticking the relevant checkboxes

☑ Listed threatened species or any threatened ecological community

8.12.1 Provide further information on potential impacts of matters of environmental significance that you have nominated above

Same as the proposed Project.

8.13 Describe any impacts on the flora and fauna relevant to the alternative proposal

Same as the proposed Project

8.24 What are the proposed measures for any alternative action to avoid or reduce the impact?

Same as the proposed Project

8.25 Do you have another alternative?

☐ Yes ☑ No

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 9

Person proposing the action

9.1.1 Is the person proposing the action a member of an organisation?

☑ Yes ☐ No

Organisation

Organisation name	Sunwater Limited
Business name	
ABN	17020276523
ACN	
Business address	Level 9, 515 St Pauls Terrace, Fortitude Valley, 4006, Queensland, Australia
Postal address	PO Box 15536, City East, 4002, Queensland, Australia
Main Phone number	07 3120 0000
Fax	07 3120 0260
Primary email address	kerrie.klopper@sunwater.com.au
Secondary email address	info@sunwater.com.au

9.1.2 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

☐ Small business
☑ Not applicable

9.1.2.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations *

☐ Yes ☑ No

9.1.3 Contact

First name	Michael
Last name	Pitman
Job title	General Manager, Corporate Development
Phone	0731200182
Mobile	0432568525
Fax	
Email	Michael.Pitman@sunwater.com.au
Primary address	515 St Pauls Terrace, Fortitude Valley, 4006, Queensland, Australia
Address	

Declaration: Person proposing the action

I, Michael Pitman **, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity.**

Signature: DocuSigned by: Michael Pitman 556683532AF34F9... **Date:** 24-07-2020

I, Michael Pitman **, the person proposing the action, consent to the designation of** Sunwater Limited **as the proponent for the purposes of the action described in this EPBC Act Referral.**

Signature: DocuSigned by: Michael Pitman 556683532AF34F9... **Date:** 24-07-2020

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Proposed designated proponent

9.2.1 Is the proposed designated proponent a member of an organisation?

☑ Yes ☐ No

Organisation

Organisation name	Sunwater Limited
Business name	
ABN	17020276523
ACN	
Business address	Level 9, 515 St Pauls Terrace, Fortitude Valley, 4006, Queensland, Australia
Postal address	PO Box 15536, City East, 4002, Queensland, Australia
Main Phone number	07 3120 0000
Fax	07 3120 0260
Primary email address	kerrie.klopper@sunwater.com.au
Secondary email address	info@sunwater.com.au

9.2.2 Contact

First name	Michael
Last name	Pitman
Job title	General Manager, Corporate Development
Phone	07 3120 0182
Mobile	0432 568 525
Fax	
Email	michael.pitman@sunwater.com.au
Primary address	Level 9, 515 St Pauls Terrace, Fortitude Valley, 4006, Queensland, Australia
Address	

Declaration: Proposed Designated Proponent

I, Michael Pitman **,the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.**

Signature: DocuSigned by: Michael Pitman ..... **Date:** 24-07-2020

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Referring party (person preparing the information)

9.3.1 Is the referring party (person preparing the information) a member of an organisation?

☑ Yes ☐ No

Organisation

Organisation name	Sunwater Limited
Business name	
ABN	17020276523
ACN	
Business address	Level 9, 515 St Pauls Terrace, Fortitude Valley, 4006, Queensland, Australia
Postal address	PO Box 15536, City East, 4002, Queensland, Australia
Main Phone number	07 3120 0000
Fax	07 3120 0260
Primary email address	kerrie.klopper@sunwater.com.au
Secondary email address	info@sunwater.com.au

9.3.2 Contact

First name	Kerrie
Last name	Klopper
Job title	Projects Advisor
Phone	07 3120 0284
Mobile	
Fax	07 3120 0260
Email	kerrie.klopper@sunwater.com.au
Primary address	Level 9, 515 St Pauls Terrace, Fortitude Valley, 4006, Queensland, Australia
Address	

Declaration: Referring party (person preparing the information)

I, Kerrie Klopper **, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.**

DocuSigned by:
Kerrie Klopper
GA2BF2017600442...

Signature: ..... **Date:** 24-07-2020

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Appendix A

Attachment

Document Type	File Name
action_area_images	Figure 1 Project location.pdf
action_area_images	Figure 4 Project study area.pdf
action_area_images	Figure 5 Protected areas.pdf
action_area_images	Figure 6 Downstream protected areas.pdf
action_area_images	Figure 3 Sunwater infrastructure.pdf
action_area_images	Figure 2 Land tenure.PDF
action_area_images	Figure 3 Sunwater Infrastructure B.PDF
govt_approval_conditions	Cwealth and State Approvals.pdf
govt_approval_conditions	Cwealth and State Approvals updated.pdf
supporting_tech_reports	In-direct impacts.pdf
supporting_tech_reports	BFD Raising Post Wet Terrestrial Survey Exec Summary.pdf
supporting_tech_reports	BFD Raising Aquatic existing environment summary.pdf
supporting_tech_reports	BFD Raising Post Wet Terrestrial Survey Report Pages 1 to 44 no figures.pdf
supporting_tech_reports	BFD Raising Post Wet Terrestrial Survey Report pg 45 to 101 no figures.pdf
supporting_tech_reports	Burdekin Projects.pdf
supporting_tech_reports	BFD Terrestrial Figures 1 to 4.pdf
supporting_tech_reports	BFD Terrestrial Figures 5 to 7.pdf
supporting_tech_reports	BFD Terrestrial Figures 8 to 10.pdf
supporting_tech_reports	BFD Terrestrial Figures 11 to 15.pdf
flora_fauna_investigation	BFD Raising Post-wet Aquatic Survey Report no figures pg 1 to 48.pdf
flora_fauna_investigation	BFD Raising Post-wet Aquatic Survey Report no figures pg 49 to 66.pdf
flora_fauna_investigation	BFD Raising Post-wet Aquatic Survey Report no figures pg 67 to 165.pdf
flora_fauna_investigation	BFD Aquatic Map 1 1 to 3 2.pdf
flora_fauna_investigation	BFD Aquatic Map 3 3 to 3 7.pdf
flora_fauna_investigation	BFD Aquatic Map 3 8 to 3 10.pdf
flora_fauna_investigation	BFD Raising Post-wet Aquatic Survey Report Map 3 11 Floodplains GDEs.pdf
flora_fauna_investigation	BFD Raising Post-wet Aquatic Survey Report Appendices.pdf

Appendix B

Coordinates

Area 1
-20.643483916404,147.14102372489
-20.643453796516,147.14086815676
-20.647550046463,147.13846489749
-20.662086826938,147.13065430484
-20.662408066051,147.12576195559
-20.656866596157,147.1264486011
-20.696696433328,147.05366417727
-20.675497982035,147.02757164798
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-20.932248651677,146.85041710696
-20.874517899207,146.84286400637
-20.818690410389,146.86415001712

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

-20.832809662798,146.77969261966
-20.810346593819,146.76183983645
-20.82254124684,146.78449913821
-20.79750905117,146.8188314136
-20.776966710611,146.88337609134
-20.739726596644,146.88612267337
-20.690915331239,146.92251488528
-20.676782820952,146.92182823977
-20.660721553129,146.94586083255
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-20.63244959847,146.9328145679
-20.592602928478,146.98843285403
-20.531527347767,146.95890709719
-20.437616295246,146.94654747805
-20.440189966472,146.95822045169
-20.485222234506,146.99117943606
-20.544065905846,147.0251683887
-20.570104240397,147.00525566897
-20.588746246152,147.03031823001
-20.582318225568,147.05469414553
-20.604493751578,147.09039971194
-20.61606231064,147.06396385989
-20.625139800756,147.08254620395
-20.624216010126,147.11842343173
-20.625260294772,147.12816521487
-20.628433269554,147.13803574405
-20.632650412133,147.14644715152
-20.639006027643,147.14705333075
-20.644608387938,147.15072259269
-20.647178577366,147.14645251594
-20.643483916404,147.14102372489