Adelaide River Off-stream Water Storage (AROWS) Project

Application Number: **02674** Commencement Date: **07/11/2024** Status: **Locked**

1. About the project

1.1 Project details

1.1.1 Project title *

Adelaide River Off-stream Water Storage (AROWS) Project

1.1.2 Project industry type *

Water Management and Use

1.1.3 Project industry sub-type

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1.1.4 Estimated start date *

30/06/2028

1.1.4 Estimated end date *

30/06/2128

1.2 Proposed Action details

1.2.1 Provide an overview of the proposed action, including all proposed activities. *

Background

The Adelaide River Off-stream Water Storage (AROWS) project (the Project) is proposed to be the next major public water supply asset for the Darwin region. To be operated as part of the existing water supply network (Darwin River Dam, McMinns & Howard East Bore field, Manton Dam), the Project aims to nearly double the current water supply to the Darwin Regional Water Supply system, to meet the projected long-term forecasted urban, industrial, and agricultural demand. The total demand for water in the Darwin region is expected to more than double by 2050 to 100 gigalitres (GL) per year.

The Project is situated in the Top End of the Northern Territory (NT). Approximately 55 km southeast from Darwin & 5 km north of Lake Bennett. Adjacent to the Adelaide River the basin resides in the Coomalie & Litchfield Local Government Areas (LGAs). A map showing the location of the project has been provided (Attachment 01, AROWS Project Locality Map).

The Daly Range consists of a geological 'basin-like' formation adjacent to the Adelaide River offers a unique opportunity for the project design. In contrast to in-stream dams, the AROWS project represents an innovative off-stream water storage initiative by eliminating the need for within-river dam infrastructure & effectively controls when water is extracted from the river, thereby protecting dry periods & preserving the natural flow of the Adelaide River. To fill the reservoir, water is proposed to be extracted from the Adelaide River during the tropical wet season at times of high flows. This favourable hydrological condition & natural geological formation provides the NT Government with a unique opportunity to deliver a major water infrastructure project, which can achieve complimentary outcomes of water availability & environmental sustainability.

The AROWS project consists of the construction, commissioning and operation of five major infrastructure components:

- Intake infrastructure (e.g. pumps) at the Adelaide River
- Basin infrastructure (e.g. dam walls in ridge gaps) along the natural ridgeline & inundation area up to the spill level
- Outlet and delivery infrastructure (e.g. outlet tower, delivery pipeline)
- Supporting infrastructure (e.g. borrow pits, cofferdams, tracks, laydowns, site facilities, substation) both temporary & permanent
- Connecting infrastructure (e.g. pipeline, balance tank) along Stuart Highway’s existing corridors

The AROWS reference project has been displayed in Attachment 02, AROWS Scheme Reference Project. Attachment 02, AROWS Scheme Reference Project consists of Map Index as Figure 2, & a map series as Figure 2.1, Figure 2.2 and Figure 2.3. The project area & maximum disturbance area figures have aimed to include these possible alternative design elements within their footprints however require refinement. The project area is 7,439.83 ha and includes a disturbance footprint of 5,610.50 ha based on the early concept design (Attachment 03, Indicative Disturbance Footprint). The disturbance area includes the basin infrastructure (~1,850.54 ha) intake, outlet, delivery and supporting infrastructure (~3,693.69 ha) and connecting infrastructure (~86.26 ha). It is noted there is a discrepancy between the proponent calculated Project area & Disturbance area and the Departments portal geospatial system of 0.32%. This is likely due to differences in the geospatial calculation methods used (e.g spherical or geographic coordinate system vs. cartesian or projected coordinate system). Please note the proponent area calculations are made using the projected coordinate system (GDA 1994 MGA Zone 52).

The NT Government, represented by the Department of Logistics & Infrastructure (DLI), i.e. the project proponent, is working closely with Traditional Owners & Custodians through the Aboriginal Areas Protection Authority (AAPA) and the Northern Land Council (NLC), to ensure that the planned activities throughout the planning & approvals phase (e.g., field surveys & site investigations etc) are undertaken in a culturally appropriate manner.

Pre-construction

Further work to be completed to inform the next level of detail on this project activity, spans multiple work streams including (but is not limited to):

- Engineering & design (e.g dam wall types to inform materials required, cut & fill)
- resolution of land tenure (e.g acquisitions, catchment protection education)
- comprehensive stakeholder engagement & community consultation (e.g project design location)
- construction methodologies (e.g site stabilisation), and
- environmental impact assessment.

Site preparation & early works:

- Early works external to the AROWS basin include access roads, power supply, potable water supply & communications associated with the temporary & permanent infrastructure
- Early works internal to the site include weather station, survey control & benchmarks
- Clearing of laydown & works areas (e.g vegetation clearance & ground disturbance for temporary & permanent works both internal & external to the basin)
- Establishment of site offices & amenities, fuel storage & refuelling stations, access & haul roads, firebreaks & fence lines internal to the basin
- Development of site material source sites/borrow areas dependant on design type of dam walls (rock, clay, filter materials, concrete materials)
- External sourcing of materials (e.g commercial quarries) - required rock material types & volumes will be confirmed during the design process & will be included in the impact assessment
- Temporary works & ancillary infrastructure required at work site
- Internal basin water supply (storage & supply) for construction works, including water supply for concrete production

Infrastructure construction

The Project is expected to have a staged construction timeframe of 4-5 years. To include both upgrades to existing infrastructure (e.g., roads) & the construction of new components (e.g intake, dam/embankment walls). The engineering concept design will guide the staging process, which will be detailed in the EIS.

MNES may be directly impacted by construction through activities such as:

- land clearing & excavation (including vegetation removal, quarrying, inundation, topsoil stripping, soil, river sediment and rock disturbance)
- increased vehicle & machine movement (e.g fauna harm & behavioural disturbance).

Indirect impacts to MNES may occur through activities such as:

- land clearing & excavation (increased dust emissions, noise, vibration)
- Increased vehicle & machine movement (e.g fauna harm & behavioural disturbance, noise & vibration)
- riverbank & water work (e.g aquatic fauna harm, poor water quality), and/or
- downstream environmental through temporary changes in hydrology.

Following completion of construction works, temporary construction areas will be rehabilitated in accordance with rehabilitation plans and relevant permits/licences/approvals. Some construction access roads may be retained for future access for operation & maintenance purposes. Topsoil removed during construction clearing will be stockpiled & utilised for revegetation where applicable. Rehabilitation may also include scour and erosion protection measures to facilitate operational aspects of the Project.

Commissioning:

The AROWS project will use staged commissioning to gradually activate components, ensuring functionality & managing risks while reducing system failure chances. MNES may be directly impacted during commissioning through the following pathways:

- land clearing (including basin inundation) resulting in loss of aquatic habitat in ephemeral drains or billabongs and/or terrestrial habitat loss, fragmentation described above
- increased vehicle & machine movement (e.g fauna harm & behavioural disturbance)
- Extraction of water from the river to fill (e.g direct aquatic fauna injury or mortality at the intake infrastructure).

Indirect impacts to MNES during commissioning may occur via:

- Changes in water levels, quality, flow & seasonal inundation from surface water extraction
- Long-term indirect impacts, in the absence of adequate design and controls may include habitat degradation associated with the introduction/spread of invasive species through vehicle movement (e.g weeds) and/or water extraction and transfer into the basin (e.g Siamese fighting fish).

Operation

This will include extracting water from the adjacent river, then transfer this water to the AROWS basin, before being transferred to a water treatment plant (to distribute into the supply network. The water treatment plant will be planned/approved & design/constructed separately to this project.

The estimated operational life of the AROWS scheme is ~100 years with an estimated annual yield capacity of around 60 GL per annum (165 ML/d) (based on current modelling) & a basin storage capacity of 250 GL at a full supply level of 32 metres Australian Height Datum (mAHD). The final operations will be determined by future licensing discussions by the NT Independant Water Controller, as well as any conditions identified in the EIS process.

MNES, may be impacted during operation through the following pathways:

- increased vehicle & machine movement (e.g fauna harm or behavioural disturbance)
- Extraction of water from the river each year (e.g direct aquatic fauna injury or mortality at the intake infrastructure)

Indirect impacts during operation may occur via:

- Changes in water levels, quality, flow & seasonal inundation may affect MNES species and their habitats upstream & downstream of the extraction site from surface water extraction
- Long-term indirect impacts, in the absence of adequate design and controls may include habitat degradation associated with the introduction/spread of invasive species through vehicle movement (e.g weeds) and/or water extraction & transfer into the basin (e.g Siamese fighting fish).

Possible direct & indirect impacts on general biodiversity and MNES are discussed in this form section 4 of this submission.

1.2.2 Is the project action part of a staged development or related to other actions or proposals in the region?

Yes

1.2.3 Is the proposed action the first stage of a staged development (or a larger project)?

No

1.2.4 Related referral(s)

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1.2.5 Provide information about the staged development (or relevant larger project).

The NT Government and Power and Water are delivering the larger 'Darwin Region Water Supply Program' (DRWSP), which is funded by the National Water Grid Authority. This Program is to be delivered in two (2) stages:

Stage 1: Address short term water security challenges by maximising the use of existing assets and already disturbed eco-systems

a) Expanded demand management and water efficiency programs – delivered by the NT Department of Lands, Planning and Environment (DLPE), Office of Water Security and Power and Water to maximise the efficient use of existing water supply infrastructure assets.

b) Manton Dam Return to Service (RTS) – delivered by Power and Water, as the short-term infrastructure solution to meet the existing water supply and demand gap and provide additional water supply redundancy in the system.

Stage 2: Meet the long-term water security needs of the Darwin region

AROWS project (focus of this EPBC referral) – delivered by DLI (Infrastructure NT) as the step change required in water supply to underpin future social and economic growth in the region and meet long term forecast demand. The greater Darwin region's current total demand for water is approximately 42,000 megalitres (ML) per year. It is expected to more than double by 2050 to around 100,000 ML per year.

1.2.6 What Commonwealth or state legislation, planning frameworks or policy documents are relevant to the proposed action, and how are they relevant? *

Commonwealth legislation

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) establishes the legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places. These are defined as Matters of National Environmental Significance under the EPBC Act.

Potential impacts of the proposal on relevant MNES would be considered in accordance with *the Australian Government guideline Matters of National Environmental Significance Significant Impact Guidelines 1.1 (Australian Government Department of the Environment 2013)*. The proposal is referred to the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) for consideration as to whether the proposal would be a controlled action and therefore require approval under the EPBC Act in addition to approval under the Northern Territory *Environment Protection Act 2019* (EP Act).

Should the proposed Project be determined to comprise a Controlled Action under the EPBC Act, the existing assessment bilateral agreement in place for NT allows for an integrated assessment process.

Other relevant Commonwealth legislation that would be subject to further assessment as part of the Environmental Impact Statement process are the *Native Title Act 1993,* the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* and the *Aboriginal Land Rights (Northern Territory) Act 1976.* An Indigenous Land Use Agreement (ILUA) is likely to be required for the AROWS project. The purpose of the ILUA is to set out an agreement between the NT Government and native title parties regarding the AROWS development, native title rights and/or interests and compensation.

State/Territory legislation

The *Environment Protection Act 2019* (EP Act) establishes the legal framework for environmental protection and sustainable management of natural resources. Under this Act, the AROWS project is initiating a referral to the NT EPA for environmental assessment and approval for a Tier 3 Environmental Impact Assessment (EIA).

The proposal would comprise development for the purpose of water supply system under the *Water Act 1992 and Water Regulations (2000)*. Under this Act, the Project will require a licence to extract surface water within the Adelaide River water allocation plan (WAP) area for the commissioning and operation phases of the project. The water extraction licence will specify the amount of water the AROWS project can extract from a designated consumptive pool as determined by the WAP.

Other relevant Northern Territory legislation that would be subject to further assessment as part of the Environmental Impact Statement process, include but are not limited to, *Territory Parks and Wildlife Conservation Act 1976* (TPWC Act), *Crown Lands Act 1992, Pastoral Land Act 199* (PL Act), *Land Title Act 2000, Northern Territory Sacred Sites Act 1989, Fisheries Act 1988, Planning Act 1999, Heritage Act 2011 (NT), Public and Environmental Health Act 2011,* and *Waste Management and Pollution Control Act 1998*.

The *Planning Act 1999* governs zoning and land use development as outlined in the Northern Territory Planning Scheme (NTPS) 2020. Land zoning will be reviewed as project design progresses, the inundation area zoning may change, however land in the upper catchment is less likely to change. The Act also establishes the Land Clearing Guidelines, which identify sensitive and significant vegetation types, as referenced in this form.

As part of the planning and approvals phase, AAPA Authority Certificates have been gained for the preliminary works, including geological, geotechnical and hydrogeological investigations, planning, project development and catchment management activities for a potential water source option. Prior to project

construction and operation, an AAPA Authority Certificate would need to be obtained that includes the final project description and project area. The NLC currently acts as a representative body for the Traditional Owners of the AROWS project site.

1.2.7 Describe any public consultation that has been, is being or will be undertaken regarding the project area, including with Indigenous stakeholders. Attach any completed consultation documentations, if relevant. *

Planning for the AROWS project started in 2011, when the feasibility assessment of the Project commenced. Since this time, there has been a number of consultation activities undertaken by Power and Water Corporation (Power and Water) (previous project lead) and the NT Government, represented by DLI, (current project lead) with a wide range of NT Government agencies and representatives (e.g., local government councils, Aboriginal Areas Protection Authority), pastoral lease holders and the general public.

Since releasing the detailed business case in 2021-2022, both the NT Government (DLI) and Power and Water commenced stakeholder and community consultation to inform the development of AROWS, including engagement with directly impacted landowners in the proposal area, multiple briefings with the NLC, AAPA, Coomalie and Litchfield Councils, and over 20 peak and industry bodies. Commencement of the AROWS environmental assessment process in early 2023, has resulted in a significant increase in consultation activities to build community understanding of the AROWS project and undertake targeted consultation with key stakeholder groups, including the establishment of a Community Reference Group (CRG) for the broader Darwin Region Water Supply Program (DRWSP). Since 2023, the proponent published relevant information in the NT News, Territory Q, social media and at relevant local venues/events.

Identification of Aboriginal stakeholders to date has been limited to advice from the NLC, and a review of claims under the *Aboriginal Land Rights Act (1976)*, and applications and determinations under the *Native Title Act (1993)*. During initial engagement with Aboriginal stakeholders, it was noted that further engagement is required with the other community leaders and the wider community. Additional stakeholders may continue to become known following the commencement of the EIS engagement program. This engagement will align with other relevant NT Government led activities such as the water allocation planning process for the Adelaide River catchment and implementation of the Territory Water Plan.

Through the early engagement, DLI has collected valuable stakeholder and community, including Indigenous communities, Traditional Owner groups and Custodians, feedback and guidance which informs the future engagement approach. DLI acknowledges that consultation is still in the early stages for a project of this complexity and scale and is currently developing a broader campaign to engage communities, individuals, and interest groups potentially affected by the Project to be included into the EIS phase. This engagement aligns with other relevant NT Government led activities such as the water allocation planning process for the Adelaide River catchment and implementation of the Territory Water Plan. This phased, coordinated and inclusive approach aims to ensure that all relevant voices are heard and that the cultural values of the area are respected and meaningfully integrated into the project planning, design, and implementation

1.3.1 Identity: Referring party

Privacy Notice:

Personal information means information or an opinion about an identified individual, or an individual who is reasonably identifiable.

By completing and submitting this form, you consent to the collection of all personal information contained in this form. If you are providing the personal information of other individuals in this form, please ensure you have their consent before doing so.

The Department of Climate Change, Energy, the Environment and Water (the department) collects your personal information (as defined by the Privacy Act 1988) through this platform for the purposes of enabling the department to consider your submission and contact you in relation to your submission. If you fail to provide some or all of the personal information requested on this platform (name and email address), the department will be unable to contact you to seek further information (if required) and subsequently may impact the consideration given to your submission.

Personal information may be disclosed to other Australian government agencies, persons or organisations where necessary for the above purposes, provided the disclosure is consistent with relevant laws, in particular the Privacy Act 1988 (Privacy Act). Your personal information will be used and stored in accordance with the Australian Privacy Principles.

See our Privacy Policy to learn more about accessing or correcting personal information or making a complaint.

Alternatively, email us at privacy@awe.gov.au.

☑ **Confirm that you have read and understand this Privacy Notice ***

1.3.1.1 Is Referring party an organisation or business? *

Yes

Referring party organisation details

ABN/ACN	84085734992
Organisation name	Department of Logistics and Infrastructure NT
Organisation address	18-20 Cavenagh Street, Darwin NT

Referring party details

Name	Catherine Turyn
Job title	Department of Logistics and Infrastructure - Environment Manager
Phone	08 8999 7901
Email	Catherine.Turyn@nt.gov.au
Address	Floor 3, Energy House, 18-20 Cavenagh Street, Darwin NT 0800

1.3.2 Identity: Person proposing to take the action

1.3.2.1 Are the Person proposing to take the action details the same as the Referring party details? *

No

1.3.2.2 Is Person proposing to take the action an organisation or business? *

Yes

Person proposing to take the action organisation details

ABN/ACN	84085734992
Organisation name	Department of Logistics and Infrastructure NT
Organisation address	Level 3, Energy House, 18-20 Cavenagh Street, Darwin 0800 NT

Person proposing to take the action details

Name	Louise McCormick
Job title	Department of Logistics & Infrastructure - Chief Executive Officer
Phone	08 8924 7123
Email	louise.mccormick@nt.gov.au
Address	Floor 3, 18-20 Cavenagh Street, Darwin 0800 NT

1.3.2.14 Are you proposing the action as part of a Joint Venture? *

No

1.3.2.15 Are you proposing the action as part of a Trust? *

No

1.3.2.17 Describe the Person proposing the action's history of responsible environmental management including details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Person proposing to take the action. *

Yes, the Department of Logistics and Infrastructure (previously Department of Infrastructure, Planning and Logistics) has a satisfactory record of responsible environmental management.

There are no past or present proceedings against the Department of Logistics and Infrastructure in relation to the *EPBC Act* or Regulations or other Commonwealth law regarding the protection of native species or ecological communities or the *Crimes Act*.

The Northern Territory Government has undertaken multiple projects in compliance with Commonwealth and Territory legislation where required. These projects have included management plans, permits and other mitigation and preventative measures to appropriately manage the potential for impacts to the environment.

Previously referred projects under the *EPBC Ac*t by either the Northern Territory of Australia or the Department of Infrastructure, Planning and Logistics include:

- 2021/9068 Darwin Ship Lift Project,
- 2018/8197 Gimbat Road-Kambolgie Creek crossing upgrade, and
- 2017-7911 Tjukaruru Road Intersection realignment and road sealing.

1.3.2.18 If the person proposing to take the action is a corporation, provide details of the corporation's environmental policy and planning framework

The person proposing to take the action is not a corporation.

1.3.3 Identity: Proposed designated proponent

1.3.3.1 Are the Proposed designated proponent details the same as the Person proposing to take the action? *

Yes

Proposed designated proponent organisation details

ABN/ACN	84085734992
Organisation name	Department of Logistics and Infrastructure NT
Organisation address	Level 3, Energy House, 18-20 Cavenagh Street, Darwin 0800 NT

Proposed designated proponent details

Name	Louise McCormick
Job title	Department of Logistics & Infrastructure - Chief Executive Officer
Phone	08 8924 7123
Email	louise.mccormick@nt.gov.au
Address	Floor 3, 18-20 Cavenagh Street, Darwin 0800 NT

1.3.4 Identity: Summary of allocation

Confirmed Referring party's identity

The Referring party is the person preparing the information in this referral.

ABN/ACN	84085734992
Organisation name	Department of Logistics and Infrastructure NT
Organisation address	18-20 Cavenagh Street, Darwin NT
Representative's name	Catherine Turyn
Representative's job title	Department of Logistics and Infrastructure - Environment Manager
Phone	08 8999 7901
Email	Catherine.Turyn@nt.gov.au
Address	Floor 3, Energy House, 18-20 Cavenagh Street, Darwin NT 0800

Confirmed Person proposing to take the action's identity

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN	84085734992
Organisation name	Department of Logistics and Infrastructure NT
Organisation address	Level 3, Energy House, 18-20 Cavenagh Street, Darwin 0800 NT
Representative's name	Louise McCormick
Representative's job title	Department of Logistics & Infrastructure - Chief Executive Officer
Phone	08 8924 7123
Email	louise.mccormick@nt.gov.au
Address	Floor 3, 18-20 Cavenagh Street, Darwin 0800 NT

Confirmed Proposed designated proponent's identity

The Person proposing to take the action is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

1.4 Payment details: Payment exemption and fee waiver

1.4.1 Do you qualify for an exemption from fees under EPBC Regulation 5.23 (1) (a)? *

No

1.4.3 Have you applied for or been granted a waiver for full or partial fees under Regulation 5.21A? *

No

1.4.5 Are you going to apply for a waiver of full or partial fees under EPBC Regulation 5.21A?

No

1.4.7 Has the department issued you with a credit note? *

No

1.4.9 Would you like to add a purchase order number to your invoice? *

Yes

1.4.10 Enter purchase order number *

60CCI2D04

1.4 Payment details: Payment allocation

1.4.11 Who would you like to allocate as the entity responsible for payment? *

Third party

1.4.12 Is the third party an organisation? *

Yes

1.4.13 Do they have an existing ABN or ACN? *

Yes

1.4.14 ABN/ACN *

84085734992

1.4.16 Organisation name *

Department of Logistics and Inifrastructure

1.4.17 Organisation's primary address *

Floor 3, Energy House, 18-20 Cavenagh Street, Darwin NT 0800

1.4.18 First name *

Evan

1.4.19 Last name *

Tyrrell

1.4.20 Job title *

Department of Logistics & Infrastructure, Enabling Infrastructure - Executive Director

1.4.21 Phone *

08 8999 6163

1.4.22 Email *

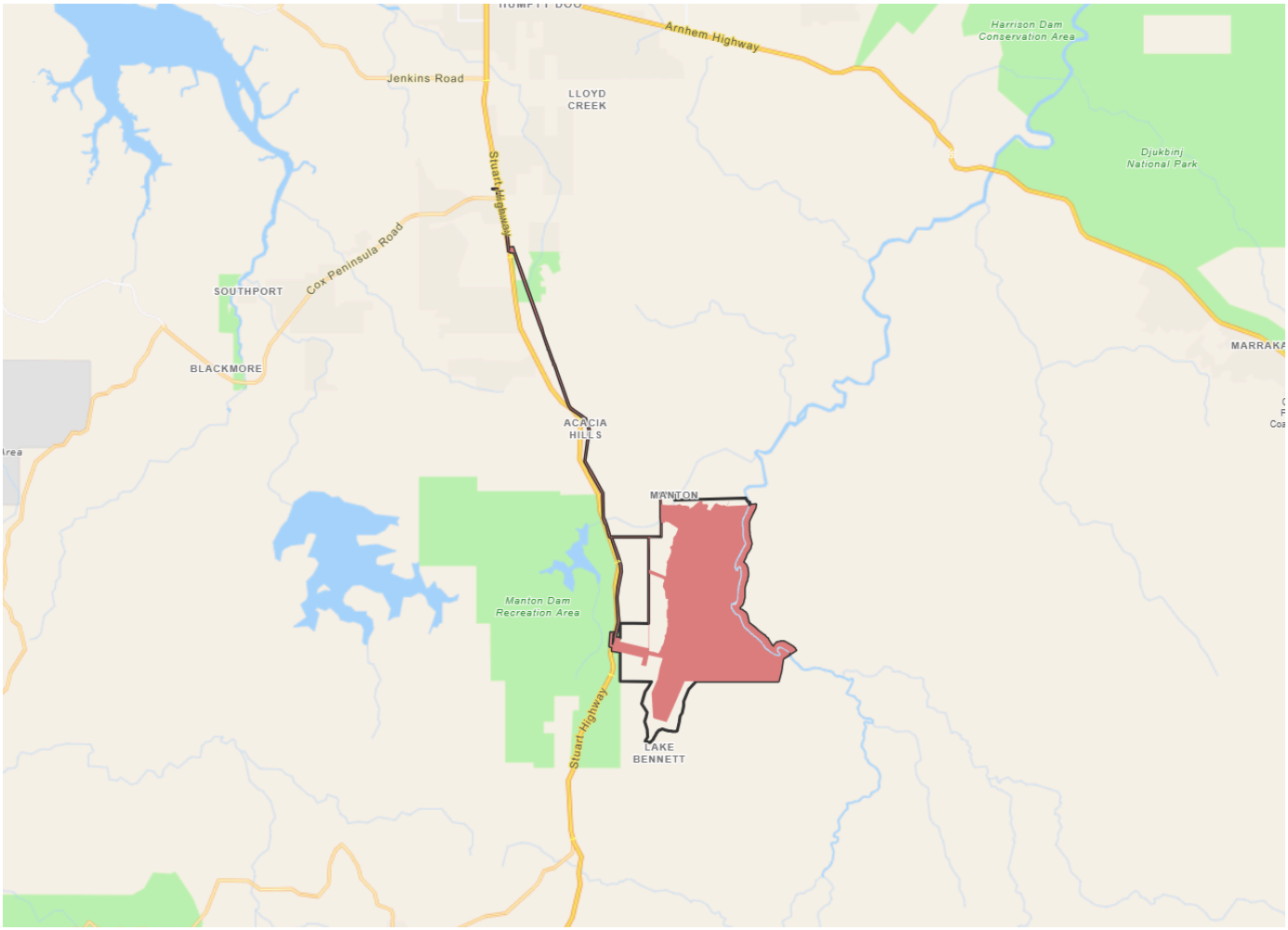
evan.tyrrell@nt.gov.au

1.4.23 Address *

Level 3, 18-20 Cavenagh Street, Darwin

2. Location

2.1 Project footprint



Project Area: 7463.90 Ha **Disturbance Footprint:** 5628.60 Ha

2.2 Footprint details

2.2.1 What is the address of the proposed action? *

The access point of the proposed action is located on section 1582 Hundred of Colton.

2.2.2 Where is the primary jurisdiction of the proposed action? *

Northern Territory

2.2.3 Is there a secondary jurisdiction for this proposed action? *

No

2.2.5 What is the tenure of the action area relevant to the project area? *

The AROWS project area spans across a number of land tenure types including Perpetual Pastoral Lease, Freehold, vacant Crown Land, Crown lease term and Crown lease perpetual, and NT Government and Litchfield Council road reserves.

The AROWS basin is predominantly on part Section 1582, Hundred of Colton (part of Koolpinyah Station, Perpetual Pastoral Lease 1147) and Hundred of Howard, Sections 113 and 117.

The AROWS intake, outlet and delivery and supporting infrastructure corridors traverse multiple land tenures including freehold lots (NT Portion 3836 and Sections 3837, 2301, 3281, Hundred of Howard, Sections 113 and 117, Hundred of Colton, Sections 1582 and 1708), Crown Lease Term (NT Portion, Section 4002) and Crown Lease Perpetual (NT Portion 3281).

The connecting infrastructure corridor (including water delivery pipeline) transverse generally alongside Stuart Highway from the AROWS basin to the future proposed Strauss Water Treatment Plant (located within existing utilities easement corridor, through multiple freehold lots, Vacant Crown Land and NTG road reserves).

Further detail on the land parcels within the project area and their tenure relevant to the project area has been displayed in a map (Attachment 04, Land Tenure).

3. Existing environment

3.1 Physical description

3.1.1 Describe the current condition of the project area’s environment.

Project area: General setting, land zoning, use and access

The AROWS project site is situated in the Top End of the NT and within the Adelaide River catchment. The region has a mixture of pastoral, freehold and indigenous land tenure.

The current disturbance in the project area is generally characterised by low levels of residential development (including scattered dwellings across Lots 113 and 117) and pastoral land use (cattle grazing on native grasses).

The AROWS basin is approximately 55 km southeast from Darwin and approximately 5 km north of Lake Bennett (~ residential area with 85 dwellings), adjacent to the Adelaide River and spanning both the Coomalie and Litchfield LGAs. The nearest residential community to the Project is Acacia Larrakia (Acacia Gap), an Indigenous community (~32 people) located approximately 2.2 km northwest from the AROWS basin within the Manton suburb and locality (~21 dwellings), according to the 2021 ABS Census.

Land tenure associated with the AROWS project area includes perpetual pastoral lease, freehold, vacant Crown land, Crown lease term, Crown lease perpetual and road reserves . Access to the AROWS project area west and east of the Adelaide River is via Stuart Highway and Arnhem Highway, respectively. The AROWS basin is intersected by the Marrakai Road (arterial road which connects the Stuart Highway in the west, to the Arnhem Highway in the east). Several road reserves (including NT Government and Litchfield Council) may be affected by the proposed infrastructure of the AROWS project as result of maintenance, upgrades, and planning works of the major and local road networks within the project area boundary.

In the proposed AROWS basin inundation area, the northern half of part Section 1582 is zoned A (Agriculture) while the southern half is unzoned (i.e. not assigned a specific zone under the NTPS 2020 but is still subject to planning controls).

Beyond the proposed water storage (inundation area) for AROWS lies the basin’s hydrologic catchment (i.e., AROWS basin catchment) where rainfall and surface water runoff are collected contributing to the proposed water storage. The northern portion of this catchment is Section 1582 and extends south towards the freehold properties north of Lake Bennett. This southern portion is zoned SLB (a specific use zone for properties surrounding Lake Bennett). The land parcels associated with the Project are anticipated to require amendments to land tenure classifications in the immediate basin, however are not expected to change in the upper catchment. Ongoing work with the community will be undertaken to embed better practices for drinking water catchments. This would potentially affect areas designated as pastoral lands, including the lot (Hundred of Colton, Section 1582) for the AROWS basin, basin catchment, and intake infrastructure. This will be determined at a later phase when tenure arrangements are registered and formalised.

A native title claim was filed over Section 1582 in 2001. This claim was discontinued in 2009. Currently, there are no registered native title claims over the land, and there has been no native title determination for Section 1582. In the absence of cogent evidence of extinguishment, it is not possible to determine the status of native title rights or interests in the land with certainty at this time. The NT Government is currently working with the NLC to assess how native title rights and/or interest will be addressed, how Sacred Sites will be protected during the construction phase and any compensation for native title parties and broader opportunities for Aboriginal people.

Bioregion

The AROWS project site is located in the Pine Creek bioregion (northern extent) which occupies approximately 28,520 km2 of the NT land mass. The Pine Creek bioregion is located in the top end of the NT and comprises foothill environments west of the western Arnhem Land sandstone massif. Outside of the Pine Creek bioregion where the project site resides, the Adelaide River extends downstream through the Darwin Coastal bioregion (northwards) to the Northern Territory coastline. The Darwin Coastal bioregion occupies approximately 27,800 km2 along the western coastline of the NT.

According to the Bureau of Meteorology (BoM)'s Climate Classification Mapping, the AROWS project site's climate zone is classified as tropical in accordance with the Köppen – major classes classification mapping. Consistent with the Köppen Climate Classification, the summer seasons around the AROWS project site are generally hot and wet. During the peak wet season (December to March), monthly rainfall averages 250 mm while no rainfall is generally recorded in the dry season. Up to 900 mm/month has been historically recorded in the catchment within a single month.

The major vegetation types within the project area are Eucalypt tall forests and open woodlands. There are also patches of monsoon rainforest, seasonally inundated *Melaleuca* woodlands, riparian vegetation and grasslands on the floodplains.

Bushfires are known to occur frequently in the dry season. The AROWS project area is within the Northern Fire Protection Zone and Vernon Arafura Fire Management Zone and is assessed as 'moderate risk' for impact from bushfire. The project area is mapped as having a burn frequency up to 9-10 events between 2013 and 2022 suggesting it has burnt once every one to two years over that period.

3.1.2 Describe any existing or proposed uses for the project area.

The majority of the AROWS basin is currently used for grazing cattle.

Multiple land uses are intersected by (or adjacent to) the proposed connecting infrastructure. These include rural residences (< 100m away from the existing easement of connecting infrastructure), grazing (modified pastures), irrigated perennial agriculture (e.g., mangos, bananas) etc.

Through discussions with Traditional Owners, Custodians and other stakeholders, the area is also used for hunting, and access for fishing.

Lake Bennett is used for tourism with a resort and several short-term accommodation buildings surrounding the lake. Some properties in the surrounding area are used for irrigated agriculture and cropping.

An archaeological survey undertaken at the AROWS project site in 2020 observed some items suggesting the area may have been used for defence activities in World War II (WWII), consistent with the broader known regional usage during that time. A WWII camp was found outside of the project area (adjacent to the access track up to Manton Gap), and it was noted that a WWII bombing range overlapped with the AROWS project site. No further historic cultural heritage was identified during the survey, however it was noted that an artillery shell was removed from site by the Australian Defence Force circa 2019 without any archaeological assessment, and that an old plough was present on a freehold lot (Lot 113), which was unable to be assessed due to access restrictions.

The future land use of the main project area will be as a 'Water Storage Facility' while the broader upstream catchment will contain the water supply source water and will require future management protections.

The intensity of the current land use is low and is unlikely to change as a result of the project, given the intended catchment protection measures to be applied in future. Detail of these measures will be developed during the impact assessment.

3.1.3 Describe any outstanding natural features and/or any other important or unique values that applies to the project area.

There are two major natural features within and adjacent to the project area:

- The ridges (including the Daly Range) that form the basin, and
- The downstream Adelaide River coastal floodplain.

The shape and formation of the basin is formed by ridges in a north-south orientation which have exerted a major influence on the topography and hydrological patterns of the Adelaide River floodplain. The three basic landform types within the AROWS basin include:

- Erosional - comprising those areas that are being actively eroded, primarily run off surfaces such as the steep side slopes and the undulating remnants of those slopes on the basin floor. Erosional landforms are the most predominant type in the AROWS basin.
- Depositional - comprising primarily run-on surfaces but including the fringe of the very gently undulating run-off areas around the fringe. This landform includes several poorly defined open and closed drainage depressions on the basin floor.
- Incisional - this landform comprises the clearly defined drainage lines and waterways within the basin, primarily De-Monchaux Creek and its tributaries, and the Manton River. Incisional landforms are being shaped by the forces of both erosion and deposition.

The Adelaide River coastal floodplain lies 50 km east of Darwin and is one of a series of adjacent coastal floodplains situated between the Adelaide River and Murgenella Creek in the Top End. The floodplain is a large seasonally-inundated freshwater floodplain that is traversed by a major and permanent tidal river. The seasonal flooding of the Adelaide River during the wet season inundates vast floodplains in the lower catchment, which recede in the dry season to create a network of semi-permanent to permanent water pools which form part of this coastal floodplain. The coastal floodplain is a Northern Territory ‘site of conservation significance’ due to the extensive floodplains supporting internationally significant numbers of many species of waterbirds(NRETAS, Territory Stories – Adelaide River coastal floodplain, 2009). Whilst the majority of this floodplain is coastal, it does extend south and parts of the AROWS project area falls within the upper portion of the Adelaide River coastal floodplain.

There are no sites of botanical significance, national parks, Ramsar wetlands or Threatened Ecological Communities (TECs) known or likely to occur within the AROWS project area.

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

The AROWS basin is characterised as an elongated oval-shaped natural basin structure, which strikes north-south measuring approximately 13 km in length and 2 to 3 km in width. The project will inundate the basin up to a full supply level of 32 m AHD. The basin’s interior is relatively flat and surrounded by a ridge of steep hills on the western side (Daly Range) and lower range hills on the eastern side (referred to as Eastern Range). The two ranges join at both the northern and southern reaches to form an enclosed natural basin structure (AROWS basin). Topographic features have been shown in a map (Attachment 05, Topographic setting) and includes the following key elements:

- The Daly Range would form a distinct topographical barrier in the landscape over 16 km in length and rises to a maximum elevation of approximately 120 mAHD. The Eastern Range is comparatively lower than the Daly Range.
- The basin floor whilst mostly flat, has two natural ephemeral drainage outlets, both following a gentle slope through the Eastern Range towards the Adelaide River, namely Central Gap and North Gap.

The land to the east of the AROWS basin consists of relatively flat lying floodplain. Two principal watercourses and their minor tributaries lie within the AROWS basin, all of which are ephemeral; the larger is De-Monchaux Creek and the smaller is un-named.

3.2 Flora and fauna

3.2.1 Describe the flora and fauna within the affected area and attach any investigations of surveys if applicable.

Terrestrial ecology – Vegetation

There is potential for some sensitive and/or significant vegetation communities, as per the Northern Territory Clearing Guidelines (*Planning Act*) to occur within the project area, with some of the mapped vegetation potentially aligning with values of

- sandsheet heath (highly restricted seasonally saturated sandsheets that support heathland or wet herbfield),
- hollow bearing (old growth) woodland or forest vegetation types (provides key hollow resources for a range of species)
- wetlands (important refugial habitat, provides critical resources). Wetlands include riparian vegetation, melaleuca woodland and seasonally inundated grassland

The basin and immediate surrounds experience some inundation and waterlogging during the wet season.

Fauna habitats within the surveyed area represent a mix of eucalypt open forest to woodland, with the upper slopes generally supporting open forest vegetation, with eucalypt density gradually decreasing with altitude and open woodland communities present on lower slopes and flats.

Tropical savannas form the major component of the northern half of the Northern Territory landscape comprising eucalypt forests and woodlands. There is extensive floristic and structural variation within Australia's tropical eucalypt woodlands and an array of fauna dependent of the ecological features provided by the community.

The edges of the AROWS basin and on side-slopes and foot-slopes is dominated by Darwin woolybutt (*Eucalyptus miniata*) and ironwood (*Erythrophleum chlorostachys*) woodlands with a mixed shrubby mid-storey. This gradually transitions into a community dominated by *Corymbia grandifolia*, often with *Terminalia grandiflora* on lower slopes and in areas that are seasonally moist but moderately well-drained. The lower-lying portion of the AROWS basin supports an intact grassland dominated by *Arundinella nepalensis* with a scattered mid-storey of *Pandanus* and *Melaleuca* species. These areas are seasonally inundated and receive surface and sub-surface run off from the adjacent slopes. Some run-on areas support an over-storey of *Lophostemon grandiflora (*closed forest*)* where a spring (Bamboo Springs) flows out into the AROWS basin.

Running through the central part of the AROWS basin is a drainage line (De Monchaux Creek) that supports a riparian forest of Weeping Paperbark (*Melaleuca leucadendra*) in the upper part of the drainage, and swamp forest dominated by *Melaleuca cajuputi* in the lower part. Adjacent to the riparian corridor on seasonally wet floodplains is a woodland of Ghost Gum (*Corymbia bella*) with over-storey and mid-storey species that can tolerate seasonally-wet subsoils. These areas may support listed threatened species including the Merten's water monitor (*Varanus mertensi*), black-footed tree-rat (*Mesembriomys gouldii gouldii*), northern brush-tailed possum (*Phascogale pirate*), and foraging sites for fauna species including gouldian finch (*Erythrura gouldian*) and partridge pigeon (*Geophaps smithii smithii*). Survey efforts and results are discussed in Appendix 06, AROWS Threatened Species Assessment, sections 1-2, pages 1-8 and shown in Appendix 08 Vegetation communities.

Terrestrial ecology – Flora

The desktop DCCEEW PMST search identified the potential for five EPBC-listed terrestrial flora species with potential to occur within the project area and/or up to 20 km buffer zone. Field surveys have been completed within the project area and a terrestrial ecologist has undertaken a likelihood of occurrence assessment.

Likelihood of occurrence results

The DCCEEW PMST search did not predict or record the presence of Threatened Ecological Communities (TECs) within a 20 km buffer of the basin, based on bioclimatic conditions, known records and the knowledge of TECs distributions. No TECs were observed during field surveys (2019 – 2022) and they are

considered unlikely to occur. A copy of the MNES, survey efforts & results are discussed throughout Appendix 06, AROWS Threatened Species Assessment, sections 1-6, pg iii-132, and shown in Appendix 08 Vegetation communities.

The likelihood of occurrence assessment for EPBC protected species within the project area and 20km buffer zone, has identified:

- one protected species known to occur, and
- four protected species unlikely to occur.

This assessment also determined another five Northern Territory level of protected species to be known or possible within the project area and/or 20km buffer zone. This includes two bladderworts, one geophyte, one cycad and one herb.

Flora surveys and vegetation mapping undertaken between 2019 and 2022 across the AROWS basin and intake infrastructure corridor identified 16 vegetation communities. These are mapped to a scale of 1:10,000. The field survey method followed the Northern Territory Guidelines and Field Methodology for Vegetation Survey and Mapping (Brocklehurst et al. 2007), which is based on three site survey intensity levels (listed in declining order of survey intensity) – full characterisation surveys, check sites and road notes. Vegetation data was collected to a standard equivalent to the National Vegetation Information System (NVIS) level V, enabling a description of vegetation communities to the association level (see Attachment 06, AROWS Threatened Species Assessment, sections 1-6, pg iii-132).

The terrestrial flora ecology in the project area is described throughout Attachment 06, AROWS Threatened Species Assessment, section 1-6, pg iii-132. This report provides:

- A summary of the terrestrial ecological surveys undertaken of the project area.
- A flora species likelihood of occurrence assessment.
- An assessment of impacts to relevant threatened species.
- Information gaps and recommendations.

Terrestrial ecology – Fauna

The desktop DCCEEW PMST search identified the potential for 29 EPBC-listed terrestrial fauna species with potential to occur within the project area and/or up to 20 km buffer zone. Field surveys have been completed within the project area and a terrestrial ecologist has undertaken a likelihood of occurrence assessment.

Likelihood of occurrence results

The likelihood of occurrence assessment for EPBC protected species within the project area and 20km buffer zone, has identified:

- four protected species known to occur;
- one protected species likely to occur;
- ten protected species possible to occur; and
- fourteen protected species unlikely to occur.

This assessment also determined another 2 Northern Territory level of protected species to be unlikely to occur within the project area and/or 20km buffer zone. This includes one mammal and one reptile.

Following the 2019, 2020 and 2022 field surveys, 4 listed threatened fauna species (black-footed tree-rat, northern brush-tailed possum, Merten’s water monitor and Gouldian finch (2 individuals) were confirmed present within the surveyed area. Additionally, the partridge pigeon was confirmed present outside of the surveyed area and is considered likely to occur in the project area. Fauna habitat observed across the project area suggests some foraging habitat for Gouldian finch, however no breeding or nesting habitat.

Surveys undertaken during this period targeted the aforementioned species as well as: masked owl (*Tyto novaehollandiae kimberli*), northern quoll (*Dasyurus hallucatus*), fawn antechinus (*Antechinus bellus*), pale field-rat (*Rattus tunneyi*) and Mitchell's water monitor (*Varanus mitchelli*).

The northern quoll was detected outside of the project area, adjacent to the AROWS basin on remote camera traps installed along the western escarpment of the basin. The bare-rumped sheath-tailed bat species is considered to have potential to occur with suitable habitat occurring within the AROWS basin.

The terrestrial fauna ecology in the project area is detailed throughout Attachment 06, AROWS Threatened Species Assessment, pages iii-132. This report provides:

- A summary of the terrestrial ecological surveys undertaken of the project area.
- A fauna species likelihood of occurrence assessment.
- An assessment of impacts to relevant threatened species.
- Information gaps and recommendations.

Terrestrial ecology – migratory species

The desktop DCCEEW PMST search identified the potential for 33 EPBC-listed migratory species with potential to occur within the project area and/or up to 20 km buffer zone. Field surveys have been completed within the project area and a terrestrial ecologist has undertaken a likelihood of occurrence assessment.

Likelihood of occurrence results

The likelihood of occurrence assessment for EPBC protected species within the project area and 20km buffer zone, has identified:

- no species known to occur;
- no species likely to occur;
- sixteen species possible to occur; and
- seventeen species unlikely to occur.

The terrestrial ecology (migratory species) in the project area is described throughout Attachment 06, AROWS Threatened Species Assessment, pages iii-132. This report provides:

- A summary of the terrestrial ecological surveys undertaken of the project area.
- A migratory species likelihood of occurrence assessment.
- An assessment of impacts to relevant threatened species.
- Information gaps and recommendations.

Aquatic ecology

The desktop DCCEEW PMST search identified the potential for 18 EPBC-listed aquatic species with potential to occur within the project area and/or up to 20 km buffer zone. Field surveys have been completed within the project area during the wet and dry season. and an aquatic ecologist has undertaken a likelihood of occurrence assessment, including an additional 3 species as a precautionary measure.

Likelihood of occurrence results

The likelihood of occurrence assessment for EPBC protected species (and additional 3) within the project area and 20km buffer zone, has identified:

- Two species confirmed present;
- Two species known to occur;
- One species may occur; and
- sixteen species unlikely to occur.

The aquatic ecology in and around the project area is described in detail in Attachment 07, Aquatic Ecology Report, pages 4-79.

3.2.2 Describe the vegetation (including the status of native vegetation and soil) within the project area.

The majority vegetation types are Eucalypt tall forests and open woodlands. There are also areas of Melaleuca woodlands, riparian vegetation and a tussock grassland community in the floodplains. Flora surveys within the surveyed area to date (i.e., AROWS basin and intake infrastructure corridor) identified 16 vegetation vegetation communities, of these E1, W3 and W4 were the most commonly observed and are displayed in Attachment 08, Vegetation communities and described in Attachment 06, AROWS Threatened Species Assessment, pages iii-132. These 16 vegetation communities include:

- Erosional landform communities
    - E1 - *Eucalyptus miniata* (Darwin Woollybutt), *Erythrophleum chlorostachys* (Ironwood), *Corymbia confertiflora* (Rough-leaved Cabbage Gum) woodland on run-off slopes on low, rolling to steep ridgelines (314 ha)
    - E2 - *Eucalyptus tetrodonta* (Darwin Stringybark), *Erythrophleum chlorostachys* (Ironwood), *Eucalyptus miniata* (Darwin Woollybutt) open woodland on gently undulating plains (9 ha)
    - E3 - *Eucalyptus tectifica* (Darwin Box), *Corymbia grandifolia* (Large-leaved Cabbage Gum), *Erythrophleum chlorostachys* (Ironwood) open woodland on gently undulating plains (92 ha)
    - E4 - *Corymbia grandifolia* (Large-leaved Cabbage Gum), *Erythrophleum chlorostachys* (Ironwood), *Corymbia confertiflora* (Rough-leaved Cabbage Gum) open woodland on gently undulating plains (589 ha)
    - E5 - *Corymbia foelscheana* (Broad-leaved Bloodwood), *Erythrophleum chlorostachys* (Ironwood), *Eucalyptus miniata* (Darwin Woollybutt) open woodland on undulating plains (37 ha)
    - U2 - *Canarium australianum* (Mango Bark), *Erythrophleum chlorostachys* (Ironwood), *Corymbia bella* (Ghost Gum) closed forest on undulating rises (3 ha)
- Depositional landform communities
    - U1 - *Mimosa pigra* (Mimosa - weed) low open forest on gently undulating plains (1 ha)
    - U3 - Bambusa arnhemica (Top End Bamboo) low closed forest on upper banks and adjacent levees (2 ha)
    - W1a - *Melaleuca cajuputi* (Cajuput), *Corymbia bella* (Ghost Gum), *Terminalia platyphylla* (Wild Plum) fringing open forest on gently undulating to level plains (52 ha)
    - W2a - *Arundinella nepalensis*, *Germainia grandiflora*, *Themeda triandra* (Kangaroo Grass) closed tussock grassland on gently undulating to level run-on plains (84 ha)
    - W2b - *Lophostemon grandiflorus* (Northern Swamp Mahogany), *Corymbia bella* (Ghost Gum), Melaleuca viridiflora (Broad-leaved Paperbark) open woodland on level to gently undulating plains (86 ha)
    - W3 - *Melaleuca viridiflora* (Broad-leaved Paperbark), *Melaleuca nervosa* (Paperbark), *Grevillea pteridifolia* (Fern-leaved Grevillea) low woodland broad open depressions and gently undulating to level run-on plains (238 ha)
    - W4 - *Corymbia bella* (Ghost Gum), *Erythrophleum chlorostachys* (Ironwood), *Corymbia polycarpa* (Small-flowered Bloodwood) open woodland on low levee banks (388 ha)
- Incised landform communities
    - W1b - *Melaleuca leucadendra* (Weeping Paperbark), *Acacia auriculiformis* (Northern Black Wattle), *Corymbia polycarpa* (Small-flowered Bloodwood) fringing open forest along watercourses that are generally deeply incised and well-defined (15 ha)
    - W1c - *Lophostemon grandiflorus* (Northern Swamp Mahogany), *Acacia auriculiformis* (Northern Black Wattle), *Erythrophleum chlorostachys* (Ironwood) fringing open forest on riparian zone of creeks and drainage lines, where incision is not as deep as for W1b (15 ha)
- Non-landform related
    - C - Cleared vegetation (6 ha).

There is potential for some sensitive and/or significant vegetation communities, as per the NT Land Clearing Guidelines (Planning Act) to occur within the project area. Some of the vegetation listed above may align with values of sandsheet heath, hollow bearing, old-growth forest vegetation and wetland

ecosystems. Riparian vegetation is also present within the basin and proposed intake corridor.

The general condition of the vegetation within the project area varies, dependent on factors such as land use, weeds, pests and bushfire. Weeds observed during flora and fauna surveys conducted in 2019 included Gamba Grass (*Andropogon gayanus*; scattered along tracks), Hyptis (*Hyptis suaveolens*; throughout the project area), Snake Weed (*Stachytarpheta spp*.; mainly in the south), Rat's Tail grass (*Sporobolus sp.*; along a creek in the south), annual Mission Grass (*Cenchrus pedicellatus*; similar distribution pattern to Gamba Grass) and Mimosa (*Mimosa pigra*; along several drainage lines and intake corridor). Feral animals have been detected in the project area, including buffalo and feral pigs, with evidence of uprooting and trampling of vegetation observed.

The vegetation within the proposed outlet, delivery, supporting and connecting infrastructure footprints has not been surveyed to date. Vegetation mapping across the remaining footprint will be undertaken during impact assessment.

There are no sites of botanical significance, national parks, Ramsar wetlands or Threatened Ecological Communities (TECs) known or likely to occur within the AROWS project area.

The AROWS basin's local geology comprises Cainozoic aged unnamed alluvial and colluvial sediments/soils overlying Proterozoic aged sedimentary rocks of the Mount Partridge Group. The proposed intake infrastructure crosses alluvial and seasonally flooded coastal floodplains, characterised by a black cracking clays over mainly calcic estuarine muds, and siliceous sands, silty brown and yellow earths, yellow podzolics.

The soils in the project area vary widely based on location and geological characteristics. Key soil types within the basin and adjacent floodplain include scree (granular soils including sandy gravel and cobbles), slopewash (colluvium) including Sand, gravel, and clay/silt) and alluvium (silty sandy clay and gravel in floodplains). There is a high probability of occurrence of acid sulfate soils (ASS) on the floodplains outside the basin, particularly along areas between the eastern ridgeline and the Adelaide River. Further geotechnical investigations and land contamination assessments are underway.

3.3 Heritage

3.3.1 Describe any Commonwealth Heritage Places Overseas or other places recognised as having heritage values that apply to the project area.

Desktop searches using the PMST in May 2023 and again in February 2024 indicates there are no Commonwealth Heritage properties located within the Project area based on the Commonwealth Heritage List (CHL), National Heritage List (NHL) or World Heritage List (WHL) stated in the technical report in Attachment 06, AROWS Threated Species Assessment, pages iii-132.

The Adelaide River and its floodplain retain important cultural values to Traditional Owners and Custodians. The Adelaide River is currently used by local residents and tourists for recreational and sporting activities including boating, fishing, hunting, tourist tours, bushwalking, bird watching and camping.

3.3.2 Describe any Indigenous heritage values that apply to the project area.

The area(s) of impact for the AROWS project are located on or near the lands of the Wulna, Larrakia, Limilgan, Kungarakan, and Warai peoples.

Archaeological survey

A preliminary archaeological survey conducted from August 31 to September 25, 2020 (total survey transects/distance completed is 208.5km) identified no Indigenous archaeological sites or objects within a portion of the project area, despite the identification of high potential areas such as laterite terraces adjacent to swamps, and rocky outcrops within the basin.

Survey limitations

The survey that was undertaken has known gaps; excluded Lots 113 and 117 due to denied access by landowners. This survey was undertaken prior to current governance structure and NT Government recognises the limitations of the survey including that Traditional Owners and Custodians were not involved during this preliminary survey.

Engagement with Traditional Owners has commenced and will continue throughout the project assessment phase, with particular focus during future heritage assessments, to identify tangible and intangible cultural and archaeology heritage values .

Sacred Sites

Registered sacred sites are located within the AROWS project area, with several areas of sensitivity having been raised through discussions and processes with Aboriginal Areas Protection Authority (AAPA), Traditional Owners and Custodians. An AAPA certificate has been obtained for the planning and investigation phase of project development which also noted additionally that the presence of Banyan trees within the AROWS project area should be determined as these may have values to Traditional Owners and Custodians. The AAPA certificate contains culturally sensitive information not in the public domain, but can be provided to the Department in confidence, and on request.

3.4 Hydrology

3.4.1 Describe the hydrology characteristics that apply to the project area and attach any hydrological investigations or surveys if applicable. *

Surface water

The project area is located within the Adelaide River catchment, adjacent to the Adelaide River. The river flows north-eastward, converging with numerous small and major tributaries throughout the catchment. Key contributors to its flow include the Adelaide River (West Branch), Margaret River, Coomalie Creek, Burrell Creek, Howley Creek, Manton River, Marrakai Creek, Otto Creek, and Wilshire Creek. Adelaide River has a total catchment area of 7,640 km2 with the Margaret River being a major tributary encompassing approximately 2,600 km2.

During the NT top end climatic wet season, the Adelaide River experiences seasonal flooding, leading to the inundation of expansive floodplains in the lower catchment. As the dry season ensues, the water recedes from floodplains and ephemeral creeks back into the Adelaide River, leaving a network of semi-permanent to permanent water pools (billabongs). This dynamic seasonal pattern shapes the ecological characteristics of the river and its surroundings.

Streamflow's have been historically recorded in the Adelaide River by the NT Government, with the closest gauging station being 5.9 km upstream of the proposed intake (identified as Dirty Lagoon streamflow gauging station G8170020). Flow data recorded between 1970-2023 indicates:

- January, February and March are the wettest flow months, with June, July and August being the driest months. Both February and March have the highest average flows for the whole year.
- The average annual flow is 1,679 GL, but it can fluctuate significantly ranging from 295 GL to 5,034 GL, highlighting a high inter-annual variability in the system.

The tidal regime at the Adelaide River mouth (approx. 135 km downstream) can see changes of up to 8m in height. The Adelaide River is categorised by semi-diurnal tides meaning there are two high tides and low tides per day. The significance of the tidal influence in the Adelaide River cannot be understated with affects to river heights observed in flow stations up to Marrakai Road i.e. extending beyond the proposed extraction location.

Groundwater

The AROWS project site comprises Cainozoic-aged, unnamed alluvial and colluvial sediments/soils overlying Proterozoic-aged sedimentary rocks of the Mount Partridge Group. It is from these two geological sediments/soil and rock units that the AROWS basin's aquifer system can be broadly differentiated into two primary aquifers; Alluvial / colluvial (shallow aquifer) and Bedrock systems (deeper aquifer).

The alluvial and colluvial deposits at the AROWS project site form a porous media groundwater flow system within the thin surficial sediments. The system may be discontinuous and transient in nature, possibly drying up towards the end of the dry season. Its thickness ranges from less than 1 m to 18 m and may become confined where this thickness allows. Water in this shallow aquifer, which is not lost to evapotranspiration, is thought to drain to the east, maintaining saturated conditions at the gaps.

The Bedrock aquifer system is associated with the siltstones, quartzites, dykes and bedrock geology and is regionally extensive. Within the basin itself, it is exposed at the surface in the ridgelines and topographically elevated areas. Elsewhere, both inside and outside of the basin, it is buried beneath a thin cover of largely unconsolidated sediments (the alluvial / colluvial system described above).

It is likely that away from the two gaps in the ridges, both aquifers form a continuous hydrostratigraphic unit, while near the gaps the upper aquifer confines the deeper fractured rock, and they form distinct aquifers with an upward gradient.

There are no Ramsar wetlands known to occur within the AROWS project area or downstream in the catchment.

Surface water modelling

Hydrologic and hydraulic modelling was undertaken in 2024, to understand the potential impacts of water extraction from the Adelaide River and adjacent storage to determine the potential maximum area of influence/indirect impact area. This was done at a preliminary level to inform the referral submission under the NT Environment Protection Act . The primary intent was to assess whether the impact from extraction is likely to extend to the river's mouth (i.e., ocean outlet). This initial assessment adopted a highly precautionary approach by simulating a 'larger than anticipated' extraction scenario to address some of the current uncertainties in the extraction rules, operational metrics and extraction site and understand the potential extent of downstream impacts.

This hydrologic modelling demonstrated that the anticipated impacts to surface water flow regime as a result of extracting water from the Adelaide River are unlikely to extend to the river mouth. Comparative analysis of simulated flow reductions at the Dirty Lagoon gauge (5.9 km upstream of the extraction site) and at two (2) locations downstream of the proposed extraction (Adelaide River Arnhem Highway gauge (40 km along the river channel) and ocean outlet (approximately 135 km along the river channel) shows impacts dissipating as flow progresses downstream of the extraction location. The simulated streamflow in January (a wet month where a significant deviation between baseline and extracted flow conditions is simulated) shows a reduction in monthly flows of 10% at Dirty Lagoon gauge (closest to point of extraction). These impacts are further reduced to 7% in monthly flow rates up to 40 km downstream at the Arnhem Highway location (due to the additional catchment streamflow contributions from the Adelaide River catchment) and to 6% of total monthly flows within the 95 km river stretch between the Arnhem Highway crossing and the ocean outlet.

Due to the large tidal regime of the Darwin region (which can exceed 8 m during spring tides), water flows naturally vary significantly across the tidal range making mangrove environments tolerant to a range of fresh and saltwater interfaces. The variable bathymetry of the mouth of the Adelaide River also influences the local tidal curves, with mixed level highs and lows that can differ day to day and across seasons. Within a highly variable tidal environment, minor changes in water levels from upstream river flows during the peak of wet season flows are unlikely to have a notable impact on the coastal environment, particularly because freshwater influx from the Adelaide River catchment is a very small portion of the overall coastal water volume.

Precautionary modelling further demonstrated under a 'larger than anticipated scenario' of extraction from the river, that connection between the river and floodplain is still maintained each year.

The outcome of this work shows that even under a high-water extraction scenario, high baseline river flows and overall flow variability in the Adelaide River remain largely unaffected. The results also indicate that impacts are unlikely to reach the ocean, with impacts to hydrological conditions of the Adelaide River occurring predominantly within a 16 km stretch downstream of the extraction site.

Modelled impacts downstream will be further avoided by determining a suitable extraction scenario. During the EIS, further modelling will be undertaken using three extraction scenarios (high, medium and low) to refine the extraction scenario at the pump station upstream, aiming to completely preclude modelled impacts from reaching the river mouth. EIS stage modelling will improve level of accuracy by including downstream river inflows.

Groundwater modelling

Numerical groundwater modelling was undertaken for the project to assess the basin's ability to retain water in storage and to evaluate potential impacts to the regional hydrogeological regime and existing groundwater users (i.e., private registered bores) from seepage to groundwater through the basin floor and ridgelines. The groundwater modelling and seepage assessment concluded the following:

- A rise in local groundwater head of <1 m may occur up to 2 km to the west, northwest and east dependent on stored water levels.
- A general increase in the groundwater elevation within the Daly and Eastern Ranges with a steeper gradient outward developed in all directions.

- For storage levels up to at least 30 mAHD, seepage out of the basin is estimated to be <1 ML/day. Seepage losses are generally linearly proportional to the storage level, with estimated losses of 0.5 ML/day and 1.6 ML/day (to 2 ML/day) for supply levels of 25 m AHD and 35 m AHD, respectively.
- Seepage out of the basin is balanced to some degree by inflow from the south and west. The groundwater table elevation to the south and west is higher than the proposed operating storage level in the basin and provides a hydraulic barrier to outflow in these directions.
- The downstream impacts from inundation (i.e. groundwater mounding) are not anticipated to extend beyond the surface drainage features of the Manton River to the west and northwest, and the Adelaide River to the east. An increase in natural groundwater contribution to the Manton River in terms of volume and duration may also be an impact of basin inundation. The water table mounding may locally effect drainage as it re-equilibrates to the operation of the storage.
- The private registered bores located outside of the basin are not anticipated to be significantly impacted, with any potential changes in groundwater level estimated to be positive, seeing a slight rise in water table elevation.
- Whilst mounding may be limited, there could be an increase in groundwater discharge to surface at new and/or existing locations.

4. Impacts and mitigation

4.1 Impact details

Potential Matters of National Environmental Significance (MNES) relevant to your proposed action area.

EPBC Act section	Controlling provision	Impacted	Reviewed
S12	World Heritage	No	Yes
S15B	National Heritage	No	Yes
S16	Ramsar Wetland	No	Yes
S18	Threatened Species and Ecological Communities	Yes	Yes
S20	Migratory Species	No	Yes
S21	Nuclear	No	Yes
S23	Commonwealth Marine Area	No	Yes
S24B	Great Barrier Reef	No	Yes
S24D	Water resource in relation to large coal mining development or coal seam gas	No	Yes
S26	Commonwealth Land	No	Yes
S27B	Commonwealth Heritage Places Overseas	No	Yes
S28	Commonwealth or Commonwealth Agency	No	Yes

4.1.1 World Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.1.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.1.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No World Heritage Places exist within or nearby the proposed action, nor is the action of a type that is anticipated to indirectly impact on this matter if it is located further afield, outside the MNES search area (beyond 20 km).

4.1.2 National Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.2.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.2.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No National Heritage Places exist within or nearby the proposed action, nor is the action of a type that is anticipated to indirectly impact on this matter if it is located further afield, outside the MNES search area (beyond 20 km).

4.1.3 Ramsar Wetland

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.3.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.3.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

No Ramsar wetlands exist within or nearby the proposed action, nor is the action of a type that is anticipated to indirectly impact on this matter if it is located further afield, outside the MNES search area (beyond 20 km).

4.1.4 Threatened Species and Ecological Communities

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Threatened species

Direct impact	Indirect impact	Species	Common name
No	No	Acanthophis hawkei	Plains Death Adder
No	No	Antechinus bellus	Fawn Antechinus
No	No	Atalaya brevialata	
No	No	Calidris acuminata	Sharp-tailed Sandpiper
No	No	Calidris ferruginea	Curlew Sandpiper
No	No	Caretta caretta	Loggerhead Turtle
No	No	Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover
No	No	Chelonia mydas	Green Turtle
Yes	Yes	Chloebia gouldiae	Gouldian Finch
No	No	Conilurus penicillatus	Brush-tailed Rabbit-rat, Brush-tailed Tree-rat, Pakooma
No	No	Dasyurus hallucatus	Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu]
No	No	Dermochelys coriacea	Leatherback Turtle, Leathery Turtle, Luth
No	No	Eretmochelys imbricata	Hawksbill Turtle
No	No	Erythrotriorchis radiatus	Red Goshawk
No	No	Falco hypoleucos	Grey Falcon
Yes	No	Geophaps smithii smithii	Partridge Pigeon (eastern)
No	No	Glyphis garricki	Northern River Shark, New Guinea River Shark
No	No	Glyphis glyphis	Speartooth Shark
No	No	Goodenia quadrifida	
Yes	Yes	Helicteres macrothrix	
No	No	Lepidochelys olivacea	Olive Ridley Turtle, Pacific Ridley Turtle

Direct impact	Indirect impact	Species	Common name
No	No	Macroderma gigas	Ghost Bat
Yes	Yes	Mesembriomys gouldii gouldii	Black-footed Tree-rat (Kimberley and mainland Northern Territory), Djintamoonga, Manbul
No	No	Natator depressus	Flatback Turtle
No	No	Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew
No	No	Petrogale concinna canescens	Nabarlek (Top End)
No	No	Phascogale pirata	Northern Brush-tailed Phascogale
No	No	Pristis clavata	Dwarf Sawfish, Queensland Sawfish
No	No	Pristis pristis	Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish
No	No	Pristis zijsron	Green Sawfish, Dindagubba, Narrowsnout Sawfish
No	No	Rostratula australis	Australian Painted Snipe
No	No	Saccolaimus saccolaimus nudicluniatus	Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat
No	No	Sphyrna lewini	Scalloped Hammerhead
No	No	Stylidium ensatum	a triggerplant
No	No	Tiliqua scincoides intermedia	Northern Blue-tongued Skink
Yes	Yes	Trichosurus vulpecula arnhemensis	Northern Brushtail Possum
No	No	Tringa nebularia	Common Greenshank, Greenshank
No	No	Tyto novaehollandiae kimberli	Masked Owl (northern)
No	No	Uperoleia daviesae	Howard River Toadlet, Davies's Toadlet
Yes	Yes	Varanus mertensi	Mertens' Water Monitor, Mertens's Water Monitor
No	No	Varanus mitchelli	Mitchell's Water Monitor
No	No	Xeromys myoides	Water Mouse, False Water Rat, Yirrkoo

Ecological communities

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4.1.4.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

4.1.4.2 Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

Threatened flora

The Likelihood of Occurrence assessment has found the Project has the potential to have a direct and/or indirect impact on the following EPBC listed flora species resulting from impacts to habitat:

1. *Helicteres macrothrix* – confirmed present (24 ha, approximately 25,000 individuals)

This species has been discussed here as they have been 'confirmed present' in the Likelihood of Occurrence assessment detailed in Attachment 06, AROWS Threated Species Assessment, sections 1-6, pages iii-132.

Approximately 25,000 individuals of the species were recorded inside the AROWS basin. However, the total count is likely an underestimate due to varying stages of growth during field surveys and difficulty for complete identification. Additionally, 14,000 individuals were recorded outside of the AROWS basin. A total area of 34 ha of the species was mapped, with 24 ha within the AROWS basin. The total 39,000 individuals recorded within and outside of the AROWS basin is likely part of the Lake Bennett sub population (approximately 2.2 km from Lake Bennett).

The proposed action has potential to impact *Helicteres macrothrix* during the construction, and/or commissioning and operation phases. Direct impacts largely relate to habitat loss

- from physical vegetation clearing for tracks, roads and laydowns in the construction phase, and/or
- inundation of the basin area during commissioning and operation.

Further investigation of this species will be undertaken including further surveys and significant impact assessment.

Threatened fauna

The Likelihood of Occurrence assessment has found the Project has the potential to have a direct and/or indirect impact on the following EPBC listed fauna species resulting from impacts to habitat:

- Gouldian Finch – confirmed present (1,800 ha suitable foraging habitat, nil breeding or nesting habitat)
- Black-footed tree-rat – confirmed present (495 ha of suitable habitat)
- Northern brush-tail possum – confirmed present (495 ha of suitable habitat)
- Partridge pigeon – Likely to occur (455 ha of suitable habitat)
- Merten's water monitor – confirmed present (51.7 ha of suitable habitat)

These species have been discussed here as they have been 'confirmed present' or considered 'likely to occur' in the Likelihood of Occurrence assessment completed in Attachment 06, AROWS Threatened Species Assessment, sections 1-6, pages iii-132.

<u>Gouldian finch</u>

Two individuals were detected in the proposed intake area in June 2019. The individuals were foraging on track side grasses. No other individuals of the species were detected despite ecologist spending significant time within the basin. It was determined that no significant breeding habitat occurs within the AROWS basin. Further, the local area is not known to be an important breeding area, and it does not contain habitat trees typically associated with Gouldian finch breeding (*E. tintinnans*). The species has been historically recorded in four locations around the Adelaide River approximately 8.5 km east of the project area, 13.5 km south at Coomalie Creek (Birdlife, 2023). The species was recorded in four locations near the Daly River (ALA, 2024). No habitat mapping has been completed for the Gouldian finch. The AROWS basin and intake corridor are anticipated to contain foraging habitat to various degrees of quality noting that primary breeding habitat has not been observed.

The proposed action has potential to impact the Gouldian finch during the construction, and/or commissioning and operation phases. Direct impacts largely relate to habitat loss

- from physical vegetation clearing (foraging habitat) in the construction phase, and/or
- inundation of the basin area (foraging habitat) during commissioning and operation.

Black-footed tree-rat

Surveys conducted in 2019 and 2020 detected the species on 23 cameras and is considered common in suitable habitat within the AROWS basin. One historical record for the species is located 4 km west of the surveyed area. The species has also been recorded from the nearby Darwin River Dam and multiple locations in the wider landscape. Due to the species' ability to utilise a range of terrestrial habitats, the black-footed tree-rat is likely to occur within areas of woodland associated with drainage channels and watercourses.

The proposed action has potential to impact the Black-footed tree-rat during the construction, and/or commissioning and operation phases. Direct impacts largely relate to habitat loss:

- from physical vegetation clearing in the construction phase, and/or
- inundation of the basin area during commissioning and operation.

Other impacts could include:

- injury or death from increased vehicular traffic.

Northern brush-tailed possum

The species was recorded by 16 cameras in 2019 and four cameras in 2020 and suitable habitat is considered to be the same area of habitat as the black-footed tree-rat, given the similarities in habitat characteristics.

The proposed action has potential to impact the Northern brush-tailed possum during the construction, and/or commissioning and operation phases. Direct impacts largely relate to habitat loss:

- from physical vegetation clearing in the construction phase, and/or
- inundation of the basin area during commissioning and operation.

Other impacts could include:

- injury or death from increased vehicular traffic.

Partridge pigeon

One unconfirmed pigeon call was heard within the AROWS basin in 2019, and the species has been confirmed outside the AROWS basin, adjacent to the project area. Field surveys comprised 25 survey days including flushing surveys and targeted waterhole searches. Historical records occur on all sides of the basin, two records occur within 1.5 km of the basin's southeast boundary, whilst two records occur along the Adelaide River, approximately 7 km southeast of the basin.

Suitable habitat for the species occurs broadly within the northern and southern extent of the surveyed area, where open, grassy woodlands occur.

The proposed action has potential to impact the Partridge pigeon (if present) during the construction, and/or commissioning and operation phases. Direct impacts largely relate to habitat loss:

- from physical vegetation clearing in the construction phase, and/or
- inundation of the basin area during commissioning and operation.

Mertens' water monitor

The species was recorded at one location within the intake infrastructure area during 2019 and on the Marrakai Track western Daly range (outside the basin). Suitable habitat was detected within the surveyed area. The species is likely to occur in riparian and aquatic habitats within the surveyed area.

The proposed action has potential to impact the Merten's water monitor (if present) during the construction, and/or commissioning and operation phases. Direct impacts largely relate to habitat loss:

- from physical vegetation clearing and soil disturbance in the construction phase, and/or
- inundation of the basin area during commissioning and operation.

Other impacts could include:

- injury or death from increased vehicular traffic.

4.1.4.4 Do you consider this likely direct and/or indirect impact to be a Significant Impact? *

Yes

4.1.4.5 Describe why you consider this to be a Significant Impact. *

A preliminary significant impact assessment has been prepared for listed threatened flora and fauna species (summarised in section 4.1.4.2 of this submission) and is provided in technical report included as Attachment 06, AROWS Threatened Species Assessment, Section 4-6, pages 25-79, Appendix A-D, pages 90-132. This preliminary assessment indicated that the Project is considered LIKELY to result in significant residual impacts for two (2) terrestrial MNES matters, *Helicteres macrothrix* and the Black-footed Tree-rat.

1. *Helicteres macrothrix*

The potential loss of 25,000 plants within the proposed 32 m basin inundation level (this inundation design level may change as the project design is further developed and in consideration of the Mitigation Hierarchy principles) has the potential to reduce the size of a sub-population, reduce the current estimated area of occupancy, and possibly affect habitat critical to the survival of the species.

2. Black-footed Tree-rat

While there is unlikely to be habitat critical to the survival of the species, the loss of 495 ha of suitable and a further 980 ha of potential habitat may reduce the size of the local population and reduce the species area of occupancy. Actual areas of disturbance are likely to change as the project design is further developed and in consideration of the Mitigation Hierchy principles.

The preliminary assessment also found the project is UNLIKELY to result in significant residual impacts for the remaining four (4) impacted terrestrial MNES matters.

1. Gouldian finch

Impact from the project on this species is unlikely to be significant, as a result of there being no habitat found that is critical to the survival of the species, the species has a wide distribution across multiple jurisdictions and climates, and important breeding habitat is absent from the project area.

2. Northern brush-tailed possum

Impact from the project on this species is UNLIKELY to be significant, as a result of individuals detected within the basin not appearing to be part of an important population and the habitats do not appear to be critical to the species survival.

3. Partridge pigeon

Impact from the project on this species is UNLIKELY to be significant, as a result of the AROWS basin being unlikely to contain an important population of the species nor habitat critical to the survival of the species.

4. Mertens water monitor

Impact from the project on this species is UNLIKELY to be significant, as a result of the reptile being detected in only one location within the basin and there are no areas of permanent surface water storage within the AROWS basin.

Detailed information on the significant impact assessment is included in Attachment 06, AROWS Threatened Species Assessment, sections 4-6, pages 29-79, and Appendix A-D, pages 90-132).

4.1.4.7 Do you think your proposed action is a controlled action? *

Yes

4.1.4.8 Please elaborate why you think your proposed action is a controlled action. *

The action was assessed against the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance criteria* (DEWHA, 2013) in the technical report included as Attachment 06, AROWS Threatened Species Assessment, Section 4-6, pages 29-79 and Appendix A-D, pages 90-132. It has been determined that the Project is considered likely to be a controlled action due to significant impacts to the two MNES; *Helicteres macrothrix* and the Black-footed tree-rat as summarised in section 4.1.4.5 of this submission.

The preliminary significant impact assessments (SIA's) are based on the AROWS basin 32 m AHD inundation footprint only, as the placement of intake, outlet, delivery, supporting and connecting infrastructure will be refined during the engineering design. The SIA's are preliminary in nature and will require revision to reflect updates to design footprints and habitat mapping refinements. Further surveys in the AROWS basin (and the AROWS project area as a whole) may identify additional impacted species.

Future updates to the significant impact assessment on MNES will be informed during the EIS stage by:

- Progressive completion of additional flora and fauna baseline surveys
- Targeted flora and fauna survey
- Project design optioneering processes (for project component engineering selection) including possible reductions in basin inundation Full Supply Level reducing impacts to environmentally important species
- Darwin Regional network supply - multi-source operating philosophy
- Darwin Regional network supply modelling, hydrological and hydraulic modelling
- Environmental Risk Assessment processes including consideration of the mitigation hierarchy (avoidance, mitigation, management controls) planned for the EIS phase.

These efforts aim to address current knowledge gaps in the project area's baseline conditions and increase confidence in assessing the significance of impacts on MNES.

4.1.4.10 Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

Changes to the natural landform and amenity landscape as a result of the Project infrastructure cannot be entirely avoided, largely due to the reliance on the landform as a natural basin. Impact avoidance strategies will be explored by DLI in consultation with relevant stakeholders and community groups to reduce the visual amenity risk and disturbance to landforms to the extent possible.

The selection of an off-stream storage, avoids impacting wet season flow transport modes by allowing the continued passage of water from upstream sources past the project site. Alternatively, instream dam designs can cause significant impact to sediment transport, aquatic habitat, and riverbank stability, potentially altering the natural landform and ecological dynamics of the area.

Further impact avoidance measures to the landform and terrestrial environmental quality will be considered throughout the project engineering design and ERA process (EIS phase). These avoidance measures will draw insights from future assessments including:

- Site geotechnical investigations and geochemical assessment which are aimed at understanding the actual risks associated with acid generating geological materials and acid sulfate soils.

- Technical studies such as fluvial geomorphology assessment and sediment transport modelling. These studies aim to assess the Adelaide River's physical characteristics (e.g., channel shape, bank stability) and potential risks of physical alterations and potential sediment deposition and erosion zones (including upstream and downstream effects of the intake).

Some avoidance and mitigation strategies may also include (but are not limited to) planning and design considerations such as:

- Intake pump and pipeline to be located along the riverbank in consideration of best bank soil geology to prevent erosion and sedimentation.

- Prioritising the use of previously disturbed land over undisturbed land where fit for purpose

- Optimising whole-of-system operations to reduce the full supply level of the reservoir (resulting in a subsequent reduction in land area impacted).

- Staging construction activities particularly associated with land disturbance around seasonality and so that land disturbance is confined to the minimum possible area and soil loss is minimised.

- Site engineering controls (e.g., slope designs, sediment basins, stockpiles, laydowns, bunding, buffers).

- General integration of erosion and sediment control (ESC) issues into construction site planning.

The AROWS project will implement mitigation measures and adopt a risk management framework to determine the effectiveness and residual risk with regards to mitigation measures. Mitigation measures will be identified as the engineering concept design and EIA progress and may include (but are not limited to):

- Implementation of ESC strategies at main construction sites, including embankment walls and road construction sites particularly near waterways/streams.

- Stormwater management (during and post-construction).

- Construction environmental management plan (CEMP) including spill containment and response procedures, hazardous goods storage requirements in line with relevant Australian Standards, waste and wastewater management practices.

- Site rehabilitation and restoration activities of the temporary disturbed areas (temporary workspaces, and temporary access roads etc).

The impact avoidance and mitigation measures shall be described in the EIS, including any site-specific mitigation measures which will be informed by the engineering concept design, technical studies, and stakeholder engagement.

4.1.4.11 Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

The Significant Impact Assessment prepared is preliminary at this stage and requires updating and completion during the EIS. DLI propose to avoid and mitigate impacts to as low as reasonably practicable prior to any consideration for offsetting.

4.1.5 Migratory Species

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Direct impact	Indirect impact	Species	Common name
No	No	Acrocephalus orientalis	Oriental Reed-Warbler
No	No	Actitis hypoleucos	Common Sandpiper
No	No	Anoxypristis cuspidata	Narrow Sawfish, Knifetooth Sawfish
No	No	Apus pacificus	Fork-tailed Swift
No	No	Calidris acuminata	Sharp-tailed Sandpiper
No	No	Calidris ferruginea	Curlew Sandpiper
No	No	Calidris melanotos	Pectoral Sandpiper
No	No	Calonectris leucomelas	Streaked Shearwater
No	No	Caretta caretta	Loggerhead Turtle
No	No	Cecropis daurica	Red-rumped Swallow
No	No	Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover
No	No	Charadrius veredus	Oriental Plover, Oriental Dotterel
No	No	Chelonia mydas	Green Turtle
No	No	Crocodylus porosus	Salt-water Crocodile, Estuarine Crocodile
No	No	Cuculus optatus	Oriental Cuckoo, Horsfield's Cuckoo
No	No	Dermochelys coriacea	Leatherback Turtle, Leathery Turtle, Luth
No	No	Eretmochelys imbricata	Hawksbill Turtle
No	No	Glareola maldivarum	Oriental Pratincole
No	No	Hirundo rustica	Barn Swallow
No	No	Lepidochelys olivacea	Olive Ridley Turtle, Pacific Ridley Turtle
No	No	Mobula alfredi	Reef Manta Ray, Coastal Manta Ray
No	No	Mobula birostris	Giant Manta Ray
No	No	Motacilla cinerea	Grey Wagtail

Direct impact	Indirect impact	Species	Common name
No	No	Motacilla flava	Yellow Wagtail
No	No	Natator depressus	Flatback Turtle
No	No	Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew
No	No	Pandion haliaetus	Osprey
No	No	Phaethon lepturus	White-tailed Tropicbird
No	No	Pristis clavata	Dwarf Sawfish, Queensland Sawfish
No	No	Pristis pristis	Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish
No	No	Pristis zijsron	Green Sawfish, Dindagubba, Narrowsnout Sawfish
No	No	Sousa sahulensis	Australian Humpback Dolphin
No	No	Tringa nebularia	Common Greenshank, Greenshank
No	No	Tursiops aduncus (Arafura/Timor Sea populations)	Spotted Bottlenose Dolphin (Arafura/Timor Sea populations)

4.1.5.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.5.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The PMST search found 35 EPBC listed migratory species predicted to occur within 20km of the project area. Of this list, three (3) have been historically recorded within 20km of the project area including:

- Forked tail swift (*Apus pacificus*) – possible to occur. Suitable habitat was observed along the Adelaide River
- Common sandpiper (*Actitis hypoleucos*) – possible to occur. Suitable habitat was observed along watercourses in the broader area
- Oriental cuckoo (*Cuculus optatus*) – possible to occur. Suitable habitat was observed along the Adelaide River

Historical records for migratory fauna were generally concentrated outside of the project area - lower in the catchment along the Adelaide River floodplain.

Field surveys 2019,2020 and 2022 of the project area did not record any observations of migratory species.

A Likelihood of occurrence assessment found the Project area is unlikely to constitute 'important habitat' for migratory shorebirds (Migratory Wetland Species) and other migratory birds. Analysis of the potential for significant impact to each species using both habitat area and ecologically significant population thresholds indicates that no migratory species is likely to be significantly impacted by the loss of habitats within the AROWS basin and intake corridor and subsequent transformation to a lacustrine habitat.

The only migratory marine species listed in the PMST report with the potential to occur within the basin or intake corridor, is the estuarine crocodile (*Crocodylus porosus*). It appears unlikely that habitats within the AROWS basin or intake corridor are 'important' for survival of this species.

A preliminary significant impact assessment for migratory species is provided in Attachment 06, AROWS Threatened Species Assessment, pages iii-132).

4.1.6 Nuclear

4.1.6.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.6.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Project is not related to a nuclear action.

4.1.7 Commonwealth Marine Area

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.7.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.7.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Project is not within or in proximity to Commonwealth Marine Areas nor is the action of a type that is anticipated to indirectly impact on this matter if it is located further afield, outside the MNES search area.

4.1.8 Great Barrier Reef

4.1.8.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.8.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Project does not occur within or near the Great Barrier Reef Marine Park.

4.1.9 Water resource in relation to large coal mining development or coal seam gas

4.1.9.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.9.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Project does not relate to a mining development or coal seam gas.

4.1.10 Commonwealth Land

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.10.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.10.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Project is not located on or near Commonwealth land.

4.1.11 Commonwealth Heritage Places Overseas

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

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4.1.11.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.11.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact. *

The Project does not relate to heritage places overseas.

4.1.12 Commonwealth or Commonwealth Agency

4.1.12.1 Is the proposed action to be taken by the Commonwealth or a Commonwealth Agency? *

No

4.2 Impact summary

Conclusion on the likelihood of significant impacts

You have indicated that the proposed action will likely have a significant impact on the following Matters of National Environmental Significance:

- Threatened Species and Ecological Communities (S18)

Conclusion on the likelihood of unlikely significant impacts

You have indicated that the proposed action will unlikely have a significant impact on the following Matters of National Environmental Significance:

- World Heritage (S12)
- National Heritage (S15B)
- Ramsar Wetland (S16)
- Migratory Species (S20)
- Nuclear (S21)
- Commonwealth Marine Area (S23)
- Great Barrier Reef (S24B)
- Water resource in relation to large coal mining development or coal seam gas (S24D)
- Commonwealth Land (S26)
- Commonwealth Heritage Places Overseas (S27B)
- Commonwealth or Commonwealth Agency (S28)

4.3 Alternatives

4.3.1 Do you have any possible alternatives for your proposed action to be considered as part of your referral? *

Yes

4.3.2 Do you have an alternative timeline you are proposing for your proposed action? *

No

4.3.3 Briefly describe why an alternate timeline for your proposed action was not possible. *

The Darwin region's water supply is currently operating at or above current capacity. The water supply demand for the region is expected to nearly double by 2050 to 100 GL per year. If sufficient water is not made available to meet these forecast demands, the ability for the NT to provide ongoing economic opportunities, livelihood improvements and secure employment will be compromised, and the overall economic prosperity of Northern Australia will be constrained. The Darwin Regional Water Supply Program (DRWSP) has been awarded funding by the National Water Grid Authority to deliver the project in two stages:

Stage 1: Address short term water security challenges by maximising the use of existing assets and already disturbed eco-systems. This includes expanded demand management and water efficiency programs towards with delivering the Manton Dam return to service and water treatment plant.

Stage 2: Meet the long term water security needs of the Darwin region. This is focused on the AROWS project.

Alternative timeframes can not be considered due to water supply demand forecasts that are well above the ability of the current sources to meet demand.

4.3.4 Do you have an alternative location you are proposing for your proposed action? *

No

4.3.5 Briefly describe why an alternative location for your proposed action was not possible. *

The Daly Range inclusive of a geological 'basin-like' formation and proximity to the Adelaide River offers a unique opportunity. In contrast to in-stream dams, the AROWS project represents an innovative off-stream water storage initiative. This approach (as developed in other countries) eliminates the need for within-river dam infrastructure, and effectively controls when water is extracted from the river, thereby protecting dry periods and preserving the natural flow of the Adelaide River.

To fill the reservoir, water is proposed to be extracted from the Adelaide River during the wet season at times of high flows. The Adelaide River catchment experiences dependable average annual rainfall (typically over 1,000 mm between November and April) draining an area of 7,640 km2. This favourable hydrological condition and natural geological formation provides the NT Government with a unique opportunity to deliver a major water infrastructure project, which can achieve complimentary outcomes of water availability and environmental sustainability.

An alternative natural geological formation adjacent to the Adelaide River with water holding properties has not been able to be located.

4.3.6 Do you have alternative activities you are proposing for your proposed action? *

Yes

4.3.3 Alternatives: Activities

4.3.3.1 Describe how the impacts and mitigation measures are different for your alternative activities.

The alternative activities are in relation to alternatives to the Reference Project with respect to infrastructure design/siting and corridor alignment options under consideration within the existing indicative disturbance footprint. A summary of the alternatives to the Reference Project include:

Intake infrastructure

- River intake infrastructure location: Alignment of the river intake structure with North Gap or Saddle No. 1 Dam and associated floodplain transfer design options.
- Intake screen requirements: (self-cleaning vs. manual cleaning), provision of fish exclusion screens noting requirements for fish screens will depend on the preferred option for intake structure arrangement, aquatic ecology assessments (e.g., species presence, environmental cues/flows) and further hydrological and hydraulic modelling of river flow.
- River intake pumping station: Alternative river extraction pump rates which seek to better optimise operational and environmental outcomes (with appropriately sized pump station, pump station sized for maximum requirement, with installation of pumps staged to meet forecast demand.
- Basin intake structure: Cut-and-cover concrete encased pipe in the foundation of the dam vs. concrete lined tunnel through the right abutment of the dam.

Basin infrastructure

- Dam(s) / embankment walls: Dam type may change dependent of outcomes of stakeholder engagement and further geotechnical studies on site.
- Spillway arrangement and location: Spillway type (to be informed by engineering design) and location at either left abutment of North Gap Dam, or Central Gap Dam or south gap (existing Marrakai Road)
- Inundation area: The Full Supply Level (FSL) and peak water supply level are subject to refinement based on projected demand and operational requirements including environmental considerations.

Outlet and delivery infrastructure

- Outlet infrastructure location at either northwest corner or central west corner (on the Daly Range), or North Gap northern abutment or Central Gap (on the Eastern Range)
- Outlet tower: Wet tower
- Outlet conduit: either cut-and-cover concrete encased pipe vs. rising main from wet tower
- Low Level Outlet location: either combined with intake infrastructure (at Central Gap) or as an independent structure
- Delivery pump station location: The location of the delivery pump station is largely dependent on the location of the outlet infrastructure and preferred route of the delivery pipeline.
- Delivery pipeline arrangement and route with arrangement including either twin pipes in place of single pipe for redundancy purposes and alternative pipeline alignments connecting the delivery pump station to the future Strauss WTP.

Supporting infrastructure

- Location of temporary works sites: Location of supporting infrastructure (i.e., access tracks, borehole investigation locations etc) within the indicative disturbance footprint will be determined in line with site geotechnical investigations and location of management areas (currently under assessment with AAPA).
- Permanent road infrastructure/design: either all weather vehicle access or no vehicle access during flood.

It should be noted that the Project is still at Concept Design stage and not yet far enough advanced in the development of engineering design and constructability to determine preferred options for the above listed infrastructure components in detail as part of this submission. These alternatives are noted as a current consideration by DLI for transparency on options being considered.

We also note that these alternative activities are restricted to the maximum disturbance footprint currently displayed in Attachment 03, Indicative Disturbance Footprint for this original proposal.

Decision-making for the design options for the project infrastructure components above will be informed by rigorous multi-criteria assessment (MCA) to evaluate, refine and select the ‘preferred’ options in the next phases of design. In order to determine the ‘preferred’ option, the MCA process (undertaken by separate engineering specialists with significant environmental input in environmental specialist advice) will use the established systematic process (guided by the Infrastructure Australia Guide to multicriteria analysis, 2021) to establish a framework using various criteria to assess the ecological sustainable development (ESD) benefits in addition to the economic, and technical benefits of each alternative.

4.3.4 Alternatives: Impact and mitigation

4.3.4.1 Do these alternatives have a different impact, avoidance, or mitigation measure compared to what you have already provided? *

Yes

4.3.4.2 On World Heritage properties *

No

4.3.4.4 On National Heritage places *

No

4.3.4.6 On the ecological character of a Ramsar wetland *

No

4.3.4.8 Listed threatened species, their habitat, or threatened ecological communities *

Yes

4.3.4.9 Describe how this alternative has different impacts or mitigations from the original proposal relating to listed threatened species, their habitat, or threatened ecological communities. *

Potential impacts to threatened species and their habitat associated with the alternative activities will be investigated as part of the MCA described above to inform the Project design optioneering.

Impact avoidance, impact minimisation and impact mitigation strategies will be explored during the EIS and informed by design, site investigations, technical studies and environmental risk assessment processes including consideration of the mitigation hierarchy (avoidance, mitigation, management controls) planned for the EIS phase.

4.3.4.10 Listed migratory species or their habitat *

No

4.3.4.12 Is a Nuclear action *

No

4.3.4.14 On Commonwealth Marine Areas *

No

4.3.4.16 Taking place in or flowing into the Great Barrier Reef Marine Park *

No

4.3.4.18 Impacts a water resource relating to a coal seam gas or large coal mining development *

No

4.3.4.20 On or near Commonwealth Land *

No

4.3.4.22 On Commonwealth heritage places overseas *

No

4.3.4.24 Action undertaken by the Commonwealth or a Commonwealth Agency *

No

4.3.5 Alternatives: Considered alternatives

4.3.5.1 Do you have any other alternative actions, including not taking the action, that you have considered but are not proposing as part of this referral? *

Yes

4.3.5.2 Describe the details of this possible alternative that you have considered but are not proposing. *

The NT Government followed a two-stage approach to assess options for augmenting the Darwin region's water supply.

- Part A: Conducted a **Preliminary Assessment** to confirm the need for water supply augmentation, evaluate non-infrastructure and infrastructure options, and justify progression to a Detailed Business Case (DBC) (Part B). A long list of 18 non-infrastructure and infrastructure options were identified and assessed, nine were shortlisted for quantitative multi-criteria assessment, five were progressed to a rapid cost-benefit analysis (including desktop environmental assessment), and the two best options were further progressed through to DBC.
- Part B: Conducted a **detailed economic, environmental, and technical assessment** of two shortlisted options from Part A. The DBC analysis process concluded Manton Dam RTS (Stage 1) and AROWS (Stage 2) is the preferred option to meet the Darwin region's water requirements in the short, medium and long term.

More information on the options assessed can be found in the DBC available online at **https://watersecurity.nt.gov.au/darwin-region-future-water-supply**.

5. Lodgement

5.1 Attachments

1.2.1 Overview of the proposed action

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 01 - AROWS Project Locality Map.pdf Project location	08/01/2025	No	High
#2.	Document	Attachment 2 - AROWS Scheme Reference Project.pdf Project components	08/01/2025	No	High
#3.	Document	Attachment 3 - Indicative Disturbance Footprint.pdf Indicative Disturbance footprint	08/01/2025	No	High

2.2.5 Tenure of the action area relevant to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 4 - Land Tenure.pdf Land tenure detail	08/01/2025	No	High

3.1.4 Gradient relevant to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 5 - Topographic Setting.pdf Topographic features	08/01/2025	No	High

3.2.1 Flora and fauna within the affected area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 6 - AROWS Threatened Species Assessment.pdf Terrestrial ecology report	07/01/2025	No	High
#2.	Document	Attachment 7 - Aquatic Ecology Survey Report.pdf Aquatic ecology report	08/01/2025	No	High
#3.	Document	Attachment 8 Vegetation communities.PDF Vegetation communities map	20/02/2025	No	High
#4.	Link	Northern Territory Guidelines and Field Methodology for Vegetation Survey and Mapping https://territorystories.nt.gov.au/10070/635994/0			High

3.2.2 Vegetation within the project area

	Type	Name	Date	Sensitivity	Confidence

#1.	Document	Attachment 6 - AROWS Threatened Species Assessment.pdf Terrestrial ecology report	07/01/2025	No	High
#2.	Document	Attachment 8 Vegetation communities.PDF Vegetation community map	21/02/2025	No	High

3.3.1 Commonwealth heritage places overseas or other places that apply to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 6 - AROWS Threatened Species Assessment.pdf Terrestrial ecology report	08/01/2025	No	High

4.1.4.2 (Threatened Species and Ecological Communities) Why your action has a direct and/or indirect impact on the identified protected matters

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 6 - AROWS Threatened Species Assessment.pdf Terrestrial ecology report	07/01/2025	No	High
#2.	Link	Adelaide and Mary River Floodplains https://datazone.birdlife.org/site/factsheet/ade..			High
#3.	Link	Atlas of Living Australia https://www.ala.org.au			High

4.1.4.5 (Threatened Species and Ecological Communities) Why you consider the direct and/or indirect impact to be a Significant Impact

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 6 - AROWS Threatened Species Assessment.pdf Terrestrial ecology report	07/01/2025	No	High

4.1.4.8 (Threatened Species and Ecological Communities) Why you think your proposed action is a controlled action

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 6 - AROWS Threatened Species Assessment.pdf Terrestrial ecology report	07/01/2025	No	High

4.1.5.3 (Migratory Species) Why your action is unlikely to have a direct and/or indirect impact

	Type	Name	Date	Sensitivity	Confidence

#1.	Document	Attachment 6 - AROWS Threatened Species Assessment.pdf Terrestrial ecology report	07/01/2025	No	High

4.3.3.1 (Activities) How the impacts and mitigation measures are different for your alternative activities

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 3 - Indicative Disturbance Footprint.pdf Indicative Disturbance footprint	07/01/2025	No	High
#2.	Link	Guide to multi-criteria analysis https://www.infrastructureaustralia.gov.au/guide..			High

4.3.5.2 (Considered alternatives) Details of possible alternatives that you have considered but are not proposing

	Type	Name	Date	Sensitivity	Confidence
#1.	Link	Darwin Region Water Supply Infrastructure Program https://watersecurity.nt.gov.au/darwin-region-fu..			High

5.2 Declarations

Completed Referring party's declaration

The Referring party is the person preparing the information in this referral.

ABN/ACN	84085734992
Organisation name	Department of Logistics and Infrastructure NT
Organisation address	18-20 Cavenagh Street, Darwin NT
Representative's name	Catherine Turyn
Representative's job title	Department of Logistics and Infrastructure - Environment Manager
Phone	08 8999 7901
Email	Catherine.Turyn@nt.gov.au
Address	Floor 3, Energy House, 18-20 Cavenagh Street, Darwin NT 0800

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ By checking this box, I, **Catherine Turyn of Department of Logistics and Infrastructure NT**, 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. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Person proposing to take the action's declaration

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN	84085734992
Organisation name	Department of Logistics and Infrastructure NT
Organisation address	Level 3, Energy House, 18-20 Cavenagh Street, Darwin 0800 NT
Representative's name	Louise McCormick

Representative's job title	Department of Logistics & Infrastructure - Chief Executive Officer
Phone	08 8924 7123
Email	louise.mccormick@nt.gov.au
Address	Floor 3, 18-20 Cavenagh Street, Darwin 0800 NT

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ I, **Louise McCormick of Department of Logistics and Infrastructure NT**, 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. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

✔ Completed Proposed designated proponent's declaration

The Proposed designated proponent is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

☑ Check this box to indicate you have read the referral form. *

☑ I would like to receive notifications and track the referral progress through the EPBC portal. *

☑ I, **Louise McCormick of Department of Logistics and Infrastructure NT**, the Proposed designated proponent, consent to the designation of myself as the Proposed designated proponent for the purposes of the action described in this EPBC Act Referral. *

☐ I would like to receive notifications and track the referral progress through the EPBC portal. *