



# **Proponent Draft Statement of Reasons (SOR) for an EIS**

## **Adelaide River Off-stream Water Storage Project (AROWS)**

Department of Logistics and Infrastructure

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# 1. Introduction

The Department of Logistics and Infrastructure (DLI), (the proponent) has determined that the proposed Adelaide River Off-stream Water Storage (AROWS) Project (the proposal) is likely to require assessment under the *Environment Protection Act 2019* by Environmental Impact Statement (EIS) and have chosen to submit a proponent initiated EIS referral.

In accordance with the NT Environmental Protection Authority (NT EPA) guidance, the referral includes a referral form, referral report, draft Terms of Reference (TOR) and draft Statement of Reasons (SOR) (this document). This SOR addresses the requirements of Section 43 of the Environment Protection Regulations 2020 to provide a statement of reasons describing why assessment by EIS is required, and why the draft TOR (submitted with the referral) are appropriate.

# 2. Statement of reasons

## OVERVIEW

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<b>Name of proposal</b>	Adelaide River Off-stream Water Storage (AROWS)
<b>Proponent name</b>	Department of Logistics and Infrastructure (DLI)
<b>Description of proposal</b>	<p>The Northern Territory Government, represented by DLI, the proponent, is proposing to develop the Adelaide River Off-stream Water Storage (AROWS) (the proposal), an off-stream water reservoir adjacent to the Adelaide River which aims to nearly double the current water supply to the Darwin region to meet the forecasted future industrial, agricultural, horticultural and urban demand in the greater Darwin region.</p> <p>The proposal comprises:</p> <ul style="list-style-type: none"><li>– Construction and operation of five (5) major infrastructure components including:<ul style="list-style-type: none"><li>• Intake infrastructure (includes all associated infrastructure for river water, extraction, transfer and release into the reservoir (pumps, pipelines) along the Adelaide River)</li><li>• Basin infrastructure (including all associated dam/embankment infrastructure and spillway along the natural ridgeline and inundation area up to spill level)</li><li>• Outlet and delivery infrastructure (including all associated infrastructure to facilitate the transfer of water from the AROWS basin to the shared infrastructure easement outlet tower, outlet conduct, low level outlet, pump station, delivery pipeline) to the connecting infrastructure</li><li>• Supporting infrastructure (including all temporary works and permanent utilities/facilities to support the construction and operation of the AROWS scheme (borrow pits, coffer dams, access tracks, laydown areas, site facilities ,electric substation, balance tank, SCADA/Telemetry, telecommunication facilities)</li></ul></li></ul>

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- Connecting infrastructure (including all associated infrastructure (pumps, pipeline, balance tank) to facilitate the transfer of water from the delivery infrastructure pipeline to the Strauss Water Treatment Plant via Hughes balance tank, along the Stuart Highway's existing corridors.
- Land disturbance of approximately 5,610.50 ha (this indicative construction footprint is based on the early concept design stage and is subject to further refinement following implementation of avoidance strategies informed by concept design and stakeholder and community engagement)
- Site rehabilitation activities undertaken progressively post-construction for the removal of temporary works and facilities and restoration of any disturbed areas.

The estimated operational life of the AROWS scheme is approximately 100 years with an annual yield capacity of 60GL per annum (165 ML/d) and a basin storage capacity of 250GL at full supply level of 32 metres AHD, subject to water licencing namely the Adelaide River water allocation plan (currently under development by the Department of Lands, Planning and Environment (DLPE)) and other approvals.

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**Nature of proposal** Utilities and services (Water)

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**Location of proposal** The Project is situated in the Top End of the Northern Territory (NT). It is located approximately 55 kilometres (km) southeast from Darwin and approximately 5 km north of Lake Bennett, adjacent to the Adelaide River in the Coomalie and Litchfield shires.

The nearest residential community to the Project is Acacia Larrakia (Acacia Gap), an Indigenous community located approximately 2.2 km northwest from the AROWS basin within the Manton suburb and locality (SAL).

The proposal area spans across a number of land tenure types and land uses including Perpetual Pastoral Lease, Freehold, vacant Crown Land, Crown lease term, Crown lease perpetual and road reserves. The AROWS basin is predominantly made up of Perpetual Pastoral Lease tenure known as Koolpinyah Station (Location 175, Section 1582) and has been used in the past for pastoral purposes.

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## JUSTIFICATION

A standard assessment by environmental impact statement (EIS) is required due to:

Objects of the  
*Environment  
Protection Act 2019*  
(EP Act) Section 42  
EP Act & Section 43  
EP Act

These principles and objects of the EP Act have been incorporated in the aims of the proposal, i.e. promoting ecologically sustainable development, long-term protection of the environment and the importance of broad community involvement including Aboriginal peoples. The Project design, construction and operation will be based on the findings of detailed studies including, but not limited to, geotechnical and geomorphological investigations, ecological and Aboriginal heritage surveys, hydrologic/hydraulic modelling, and multicriteria assessments to minimise and manage impacts. Environmental outcomes are considered by the proponent when comparing design options and selecting preferred option(s) for the proposed proposal infrastructure.

General duty of proponents has been taken into consideration at high level, however the planning and development of the proposal needs to progress (Section 43).

At a high level, the preliminary concept design and planned infrastructure in the detailed business case have considered principles of ecologically sustainable development, the environmental decision-making hierarchy, and the waste management hierarchy.

Section 59 of the Environment Protection Regulations 2020

(a) the potential for significant impacts of the proposal on 10 NT EPA environmental factors.

(b) the need to improve the level of confidence in predicting and quantifying potential significant impacts of the proposal taking into account the extent and currency of existing knowledge, particularly in relation to:

- Impacts to landforms, terrestrial environmental quality, terrestrial and aquatic ecosystems, hydrological processes, inland water environmental quality, community and economy, culture and heritage, human health during construction, commissioning, operation and closure of proposal components
- The significance of impacts to threatened species and habitats (NT and Commonwealth protected matters) in the terrestrial and aquatic environments
- Information about social, economic and cultural impacts that may arise through engagement and consultation with communities affected by the proposal and the significance of impacts to cultural values (tangible and intangible) within the proposal area.

At this stage of the proposal, the environmental and cultural values, risks and mitigation measures are yet to be assessed or addressed in detail across the entire proposal area (area of impact and area of influence) leading to gaps and uncertainties.

(c) the need to develop measures in accordance with advice from relevant NT Government advisory agencies, native title holders, Traditional Owners/Custodians and/or their representatives to avoid, mitigate or manage potential significant impacts, and increase the confidence in the effectiveness of the proposed measures.

(d) & (e) the need to build on the extent of community engagement including land holders, Traditional Owner groups, Custodians and Indigenous communities that has occurred to date in relation to the proposal, including the provision of further opportunities for stakeholders and community to:

- Share potential impacts and benefits to be captured within the EIS
- Facilitate engagement to inform social and cultural values impact assessment
- Provide advice and inputs into strategies for impact avoidance and management of negative social, economic and cultural impacts and maximisation of community benefits.

Consultation outcomes

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 (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.

Significant stakeholder engagement with the community, Northern Land Council (NLC), industry and agricultural stakeholders, advocacy groups among other stakeholder interest groups was undertaken from 2013 to 2019 to inform the AROWS project, initially through the Detailed Business Case (DBC) process and subsequently as part of the Project's pre-concept design phase.

Since releasing the DBC 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 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 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.

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.

#### Other reasons

The Adelaide River water allocation planning process is underway and due to the nature of this assessment it is likely valuable inputs could be considered under the EIS.

#### Environmental factors and objectives.

DLI considers that the proposal has the potential to significantly impact environmental values associated with the following environmental factors<sup>1</sup>.

#### Land

- **Landforms** - The proposal is certain to result in a permanent change to the natural landforms due to the construction and operation of permanent infrastructure and facilities such as the embankment walls along the Daly Range and Eastern Range, intake structure along the Adelaide River, permanent roads, water and energy infrastructure across the proposal area (e.g., substation, water reservoir etc).  
Further work is required to investigate avoidance and mitigation strategies through technical studies, concept design and options assessment, and in consultation with the relevant stakeholders and community, including Aboriginal Areas Protection Authority, Traditional Owners, Custodians and Indigenous groups to mitigate, if not prevent, impacts on the landforms (e.g., natural ridgeline, Adelaide River morphology) and the

<sup>1</sup> NT EPA Environmental factors and objectives

cultural values that may be associated to the distinctive landscape surrounding the proposal area.

- **Terrestrial environmental quality** - The proposal has the potential to impact land and soil integrity and quality. There is uncertainty about the significance of potential and residual impacts (post mitigation) to the terrestrial environmental quality (including the environmental and cultural values the latter may be supporting and/or maintaining) particularly as a result of the disturbance of potential acid sulfate soils (PASS) or actual acid sulfate soils (AASS) and acid forming material due to site clearing and preparation activities.

Further geotechnical and geochemical investigation is required to better delineate the distribution and potential severity of PASS/AASS across the proposal area (particularly at the AROWS basin and proposed intake infrastructure location) and improve the understanding of the bulk rock geochemical characteristics of all material that is intended to be excavated for the construction of the proposal and inform design criteria for infrastructure and construction approach, materials management and site rehabilitation requirements.

- **Terrestrial ecosystems** - Targeted surveys to date have mainly assessed baseline conditions (species presence/absence, vegetation mapping) within the proposed AROWS basin and intake infrastructure corridor.

Further work is required to assess baseline conditions of terrestrial ecosystem values (vegetation mapping, species presence/absence and habitat condition/quality) within the proposal's area of impact (i.e., across the entire construction footprint) and area of influence to improve the level of confidence in the assessment of impact significance to NT and Commonwealth protected matters while considering the mitigation hierarchy.

Further work is required to assess the biodiversity offsets management strategy in line with NT and Commonwealth offsets policies and legislative requirements including development of the habitat quality approach / metrics for significantly impacted species and targeted surveys for proposed offset area(s) (species presence/absence and habitat condition/quality).

## Water

- **Hydrological processes** - The proposal requires the extraction of water from the Adelaide River during wet season flows. The initial hydrologic and hydraulic modelling adopted a conservative approach simulating a larger than anticipated extraction under various flow conditions to assess potential impacts of water extraction on the Adelaide River including its flow regime and flood inundation extent and determine the potential area of influence to inform the referral submission. This assessment indicated that impacts are unlikely to reach the ocean, with impacts to hydrological conditions of the Adelaide River occurring within a 16 km stretch downstream of the extraction site.

Further work is required to assess potential impacts from alterations of river flow conditions under various extraction scenarios (while considering climate change projections) to determine the preferred operating rules for the AROWS scheme. This work will also consider potential impacts on environmental cues and indicator species to inform the rules and conditions of extraction.

There is uncertainty with respect to the scale (extent) and magnitude of construction drawdown that could occur for the construction of embankment walls, and the timeframe for recovery of groundwater to pre-construction levels. Further site specific investigations (e.g., groundwater monitoring, census of registered bores) and groundwater flow modelling are required to inform a more accurate assessment of groundwater level impacts during construction (drawdown) and operation (seepage and mounding) through the EIS process.

- **Inland water environmental quality** - The proposal has the potential to impact surface water and groundwater quality including the environmental and cultural values that may be supported by these inland water resources. During construction, impacts to surface water quality may arise from ground disturbing activities, in-channel construction activities and accidental fuel/chemical spills. During operation, alterations to the natural flow regimes due to water extraction may result in changes to water quality constituents of the Adelaide River (e.g., temperature, salinity, dissolved oxygen, turbidity etc) and sedimentation/deposition rates upstream and downstream of the proposed intake location.

Further work is required to collect baseline data (surface water and sediment quality) across the proposal area (area of impact and area of influence), assess fluvial geomorphology, and undertake further hydrologic/hydraulic modelling (including water quality modelling and sediment transport modelling) using collected data for impact assessment on surface water quality.

Contamination of groundwater may occur as a result of exposure to and/or disturbance of PASS/AASS, if present, from excavation works and construction dewatering or due to accidental spills. During operation, changes to local groundwater quality from seepage of stored surface water in the AROWS basin may result in changes to quality of groundwater available to existing downstream groundwater uses (e.g., private registered bores, terrestrial and aquatic GDEs).

Further work is required to collect baseline groundwater quality data across the proposal area (area of impact and area of predicted groundwater mounding).

- **Aquatic ecosystems** - The Territory hosts a range of high value aquatic ecosystems, namely estuaries, lakes and wetlands which have important intrinsic environmental and cultural values. The Adelaide River is a habitat for NT and Commonwealth threatened and protected river sharks (Glyphis species) and sawfish (Pristiformes) and is a popular recreational fishing area. There is uncertainty about the significance of potential impacts to the Northern river shark, Speartooth shark and Largetooth sawfish and other listed species (freshwater and estuarine crocodiles) particularly from the proposal's water extraction activities and alteration of the natural flow regime of the Adelaide River.

Further survey effort and assessment is required to assess baseline conditions of aquatic ecosystems/species within the proposal's construction footprint and the downstream environment (limited to the area of influence as demarcated by the hydraulic modelling), predict potential impacts on aquatic values (including cultural values) and ecosystem functioning while considering the mitigation hierarchy.

#### Air

- **Atmospheric processes** - The proposal is not likely to trigger the Northern Territory Large Emitters Policy based on the current greenhouse gas emissions (GHG) assessment. Further work is required to update the existing GHG emissions inventory as the proposal's concept design is progressed and refined, and to re-assess the proposal's Scope 1 and Scope 2 emissions and contribution to the NT's and Australia's total annual GHG emissions.

#### People

- **Community and economy** - The proposal will provide benefits to the Territory more broadly. Further work is required to quantify the potential benefits for the different communities and to determine measures that can be taken to maximise local community and Aboriginal benefits.

There is uncertainty regarding other potential socio-economic benefits and impacts of the proposal and further assessment is required in consultation with the community.



- **Culture and heritage** - There is potential for proposal activities, primarily during construction, to impact both known and unknown archaeological sites, or objects, heritage places or cultural features. This includes both tangible and intangible heritage, through potential impacts to connections held between the local Aboriginal people and Country.

Further work is required to assess cultural values within the proposal's area of impact and area of influence and quantify the potential impacts on Aboriginal values.

- **Human health** – As part of the early concept design phase of the Project, a dam break and consequence assessment was previously carried out. The dam break and consequence assessment requires updating to reflect the latest concept design (e.g., spillway design, etc). This study will be coupled with a dam failure impact assessment to assess long-term impacts on human health.

There is uncertainty that the proposal would increase the risk to nearby residents from biting insects and crocodiles as a result of a permanent water body (AROWS basin). Other determinants of health values relevant to the proposal include factors such as bush tucker, transport, ecosystems, biodiversity, historic heritage, ambient air, and water quality. While the proposal is unlikely to have a significant impact on air quality values and human health post implementation of proposed mitigation measures, several road reserves may be affected by the proposed infrastructure of the Project. DLI will collaborate closely with the relevant stakeholders on the maintenance, upgrades, and planning of the major and local road networks within the project area boundary. Further work is required to assess traffic impacts on the potentially impacted road networks.

Social and cultural values impact assessment studies are required to assess potential impacts on the general wellbeing of potentially affected communities including Traditional Owners, Custodians, and Indigenous communities.

### **Appropriateness of the Terms of Reference (TOR)**

The Draft terms of reference (TOR) have been prepared in accordance with the '*Preparing a proponent initiated EIS referral - Environmental impact assessment guidance for proponents (NT EPA, March 2021)*'. The draft TOR outline how the EIS will assess and address potential impacts of the proposal, targeting the key environmental factors identified above in addition to matters of national environmental significance protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The draft TOR have been developed based on the preliminary impact assessment provided in the referral and are considered an appropriate framework to guide the preparation of the EIS for the AROWS project, to provide certainty regarding the significance of potential impacts to each of these factors to inform assessment by the EPA (and the Department of Climate Change, Energy, the Environment and Water) and a decision by the NT Minister for Environment and Natural Resources and the Commonwealth Minister.

### **Conclusion**

Given its extensive scope which includes various infrastructure components, water extraction, its purpose as a 60GL off-stream water storage reservoir, and its strategic location near the Adelaide River and Adelaide River Coastal Floodplain in the Top End, the AROWS project has potential for significant impacts on the environment, including matters protected under NT and Commonwealth legislation.

An EIS assessment process is an appropriate approach to facilitate the detailed assessment of these potential impacts, and to develop appropriate avoidance, mitigation and management measures to reduce the extent or level of significance of impacts. DLI is determined to ensure that the proposal will deliver a net benefit to the environment and community, including heritage and social values influenced by the proposed water supply project.

The draft TOR provide appropriate guidance for the EIS assessment process under the EP Act. An EIS assessment process, in addition to facilitating a robust environmental impact assessment, will provide the opportunity for communities that may be affected by the proposal, including Aboriginal communities, to participate in the process and have their views considered as part of the AROWS project design.

Through the proposed EIS process, impacts will be carefully assessed, and management and mitigation measures will be developed. This will be done by integrating information from additional studies and actively engaging with stakeholders, ensuring that all perspectives are incorporated into the project's design, planning and implementation.