A Marsden Jacob Associates report
for the Northern Territory Government

Preliminary Business Case for the

ORD RIVER EXPANSION

to the Northern Territory

Contents

Acknowledgement of Country

This report was created on Whadjuk Noongar, Miriuwung and Gajerrong and Wurundjeri Kulin Country. The authors acknowledge the Traditional Owners and Custodians of Country throughout Australia, and their continuing connection to land, water, and community. We pay our respects to Elders both past and present, and we extend that respect to all First Nations people.

We are grateful to the Aboriginal and Torres Strait Islander people and communities we have the privilege of working with, for sharing stories, values, beliefs, and culture.

Contributors

This Preliminary Business Case (PBC) was funded by the Australian Government through the National Water Grid Fund.

Marsden Jacob Associates led the preparation of this PBC in partnership with Pinion Advisory, IPS Management Consultants, and the Northern Territory and Western Australian governments. This summary report was designed by WordFusion.

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Executive summary

The Ord River Expansion to the Northern Territory project is critical to unlocking Northern Australia's abundant and untapped economic potential.

Rationale

There are abundant economic opportunities in Northern Australia. This includes large areas along the Northern Territory/Western Australia (NT and WA) border that have been identified as highly suited to irrigated agriculture and agricultural diversification, and that have attracted significant interest from investors. Developing this potential will drive economic growth, diversification and opportunities in the NT, WA and nationally.

A reliable and sustainable water supply is needed to provide the level of surety needed for investors and enterprises to develop this potential.

The existing Ord River Irrigation Scheme (ORIS), located in WA, is the closest reliable source of water. The ORIS infrastructure network extends to within six kilometres of the NT border and is within reach of development opportunities. Expanding the ORIS to the NT will provide the water security for developments. However, the current infrastructure cannot support this level of expansion or meet the region's growing water needs and demand. Private sector irrigators are unable to independently fund the expansion.

The NT Government, with the support of the Australian and WA governments, seeks to extend the ORIS across the border to open up to 24,000 additional hectares in the NT and WA for irrigated agriculture.

The proposed Ord River Expansion to the Northern Territory project (Ord River Expansion Project) cannot proceed without Australian Government investment.

Preliminary Business Case

The Ord River Expansion Project Preliminary Business Case (PBC) investigated 11 viable options for extending the ORIS from WA to the NT. The PBC's scope was the necessary infrastructure to enable the existing ORIS to supply up to 24,000 ha of irrigated agriculture across both the NT and WA.

The 11 options were shortlisted to three through a thorough assessment of costs, benefits, risks and public interest considerations in line with Australian Government investment decision making frameworks. Further investigation was conducted into the shortlisted options, including eligibility for Australian Government investment.

Shortlisted Options

The three shortlisted options present unique approaches to expanding irrigation capacity and efficiency in the Ord region, and to catering to agricultural development needs in the NT and WA. Each of the three options allows for phased implementation, with each stage laying the groundwork for later development phases.

Option 1 – Knox Channel and Lake Kununurra Pipeline

This concept proposes delivering peak irrigation demand to the farm gate during the dry season, which minimises on-farm storage. The concept will be delivered in two 'packages' to meet short-, medium- and long-term irrigation demand (Table 3). The concept includes other developments within WA such as Cockatoo Sands-Victoria Highway and Ivanhoe plain, as well as the identified developments in the NT.

Option 2 – Duplication of M1[1] Channel located in Stage 1

This concept proposes delivering peak irrigation to the farm gate during the dry season, which minimises on-farm storage. This concept will ensure peak supply to proposed NT developments while maintaining existing levels of service in WA (Table 6).

Option 3 – Channel with off-scheme storage

This concept proposes supplying on-farm water demand using the off-peak capacity of the existing ORIS. This will draw water during the wet season for on-farm storage and use during the dry season (Table 9).

Assessment

Under all three options, the Ord River Expansion Project is expected to deliver economic returns, stimulate regional development, and create substantial direct and indirect employment opportunities. Much of this will flow to local and regional economies through increased demand for agricultural inputs, downstream processing and supply chains. Traditional Owner groups and First Nations people are likely to be key beneficiaries of the economic benefits arising from the projects, primarily through the employment and business opportunities it will generate.

The PBC demonstrates that the shortlisted options are viable, and it supports the NT Government's application to the Australian Government for Detailed Business Case development funding.

Recommendation: Construct the missing link between the M2S and the NT border

The first step in progressing the Ord River Expansion Project is constructing the missing infrastructure link – a channel between the ORIS and the NT border. This missing link is a necessary component of, and precursor to, all three options.

Construction of the missing link will allow the transfer of water to the NT and lay the groundwork for future infrastructure development. The link is a cost-effective measure that will ensure a continuous progression towards the Ord River Expansion project's goal of expanding irrigated agriculture on both side of NT/WA border.

[1] Location of channels and system layout shown on page 38.

Background and context

Opportunity

There are abundant underutilised economic opportunities in Northern Australia. However, this potential remains unrealised due to current water supply constraints. Developing this potential will drive economic growth, diversification, sustainability and opportunities in the Northern Territory (NT), Western Australia (WA) and nationally.

Reliable and sustainable water supply will provide the level of surety needed to attract investors and enterprises to develop the economic opportunities.

These opportunities include developing areas that have:

- Been identified as highly suited to irrigated agriculture, such as the Keep Plains along the NT/WA border and Cockatoo Sands
- The potential for agricultural diversification supported by a diverse crop array in addition to current livestock and grazing enterprises.
- Attracted significant interest from investors and enterprises, such as the AAM Investment Group, Kimberley Cotton Company, Kimberley Agricultural Investment, and MG Corporation, which represents Traditional Owners and Native Title Holders in WA.

Challenge

The NT Government, with the support of the Australian and WA governments, seeks to extend the existing Ord River Irrigation Scheme (ORIS) across the border to open up to an additional 24,000 ha in the NT and WA to irrigated agriculture.

However, the current ORIS infrastructure cannot support this level of expansion or meet the region's growing water needs and demand, even with planned upgrades. Private sector irrigators are unable to independently fund the required level of infrastructure expansions.

Needs analysis

The proposed Ord River Expansion to the Northern Territory project (Ord River Expansion project) can deliver nationally important water infrastructure that will improve water access, quality and security for agricultural developments that will generate regional economic growth[2]. However, it cannot proceed without Australian Government investment.

Suitable government investment sources include the National Water Grid Fund (NWGF) – the Australian Government's primary program for investments in projects to improve water access and security – and the Northern Australia Infrastructure Facility.

Australian Government investment in this project will support the realisation of substantial public benefits, as well as broader Australian, NT and WA government priorities, including:

[2] National Water Grid Investment Framework

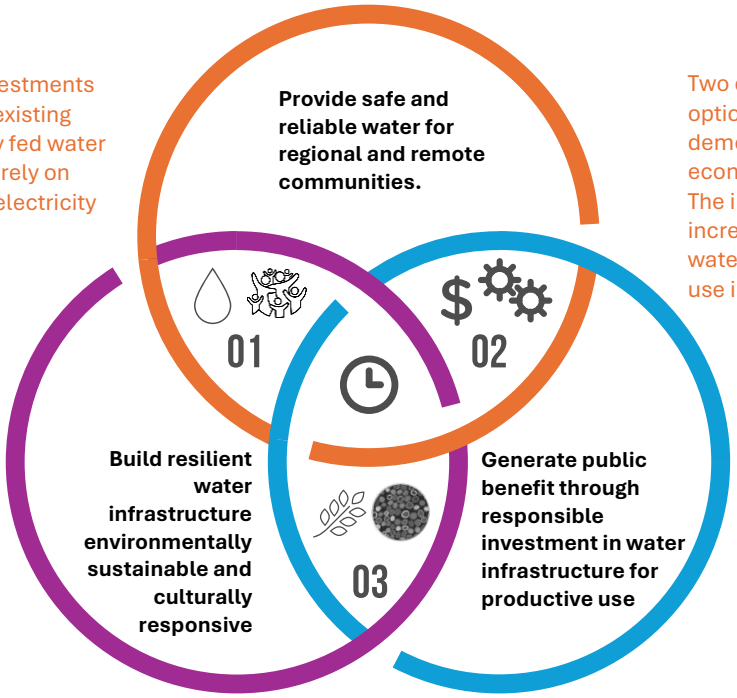
- Longstanding shared Australian, WA and NT government efforts to:
  - Fully utilise the Northern Australia region to enhance national resilience and capacity and generate sustainable productivity that can improve the lives of all Australians. [3]
  - Close the gap in the entrenched inequality faced by First Nations peoples, so that their life outcomes are equal to those of all Australians.
  - Ensure the safe and sustainable use of Australia's natural resources, balancing environmental protection, climate change action and resilience, and economic growth and development.
- The NT Government's key priorities of:
  - Realising a $40 billion economy by 2030
  - Diversifying economic sectors.
  - Achieving net zero by 2050.
  - Creating 35,000 new jobs.
  - Growing the NT's population beyond 300,000 people. [4]
- The WA Government's key priorities of:
  - Diversifying the economy and creating sustainable local jobs.
  - Building safe, strong, fair and thriving communities.
  - Investing in WA's future by tackling climate change and promoting vibrant communities.

[3] Our North, Our Future: White Paper on Developing Northern Australia (infrastructure.gov.au)

[4] NT Infrastructure Strategy 2022-2030

NWGF Strategic Objectives

The proposed investments will leverage the existing low energy gravity fed water supply system or rely on renewable hydroelectricity where required.



Two of the three shortlisted options have a demonstrable net economic benefit.
The investments will increase the reliability of water supply for productive use in agriculture.

The proposed investments will be developed through close engagement with Miriuwung-Gajerrong people as well as other Traditional Owner groups in the Northern Territory.

Eligibility criteria

New capital investment in infrastructure that increases the security, quality and/or availability of water for regional and remote communities, and/or productive use.

All options seek to increase the availability of water for agricultural production.
Creates opportunity for Traditional Owner management and ownership of water and agricultural infrastructure.

Demonstrable public benefit with a national interest element and demonstrated engagement with affected stakeholders (including First Nations people).

The Ord Irrigation scheme is a nationally significant water supply asset. Expansion into the Northern Territory gives the Australian Government the opportunity to share a valuable resource across two jurisdictions.
The project includes close consultation with the MG Corporation on behalf of the Miriuwung Gajerrong People and the NLC.

Brought forward with strong support by a state or territory government (including securing funding contributions) and is dependent on a Commonwealth contribution.

This proposal is brought forward by the NT and WA governments with the support of the National Water Grid Authority.

Purpose

Purpose of the Preliminary Business Case

The PBC's overarching purpose was to investigate viable options for extending the ORIS from WA to the NT.

The PBC's scope was the necessary infrastructure needed to enable the existing ORIS to supply up to 24,000 ha of additional irrigated agriculture across both the NT and WA, from a highly reliable supply backed by the proven water security of Lake Argyle Dam.

The three shortlisted options, from a list of 11 viable options, were investigated in detail, as outlined in this summary document.

Consistent with Infrastructure Australia's Assessment Framework, the National Water Grid Investment Framework, and the NT Government's Project Development Framework (NTPDF), the PBC comprised:

- A preliminary assessment of the Ord Expansion project's economic benefits, with a focus on its potential to enhance local, regional and national economic prosperity.
- An evaluation of the project's commercial viability to ensure is both feasible and financially sustainable.
- An assessment of land suitability in the proposed expansion area to ensure optimal resource use and to minimise ecological impact.
- Recommendations on preferred option for the Ord River Expansion to the NT, including considerations for a Detailed Business Case Assessment (DBC).
- An assessment of the project's strategic fit to identify and determine its alignment with Australian, NT and WA Government policies, plans and strategic objectives.

Options development and assessment

Existing Ord River Irrigation Scheme (ORIS)

The ORIS is located North of Kununurra in WA's East Kimberley (Figure 1).

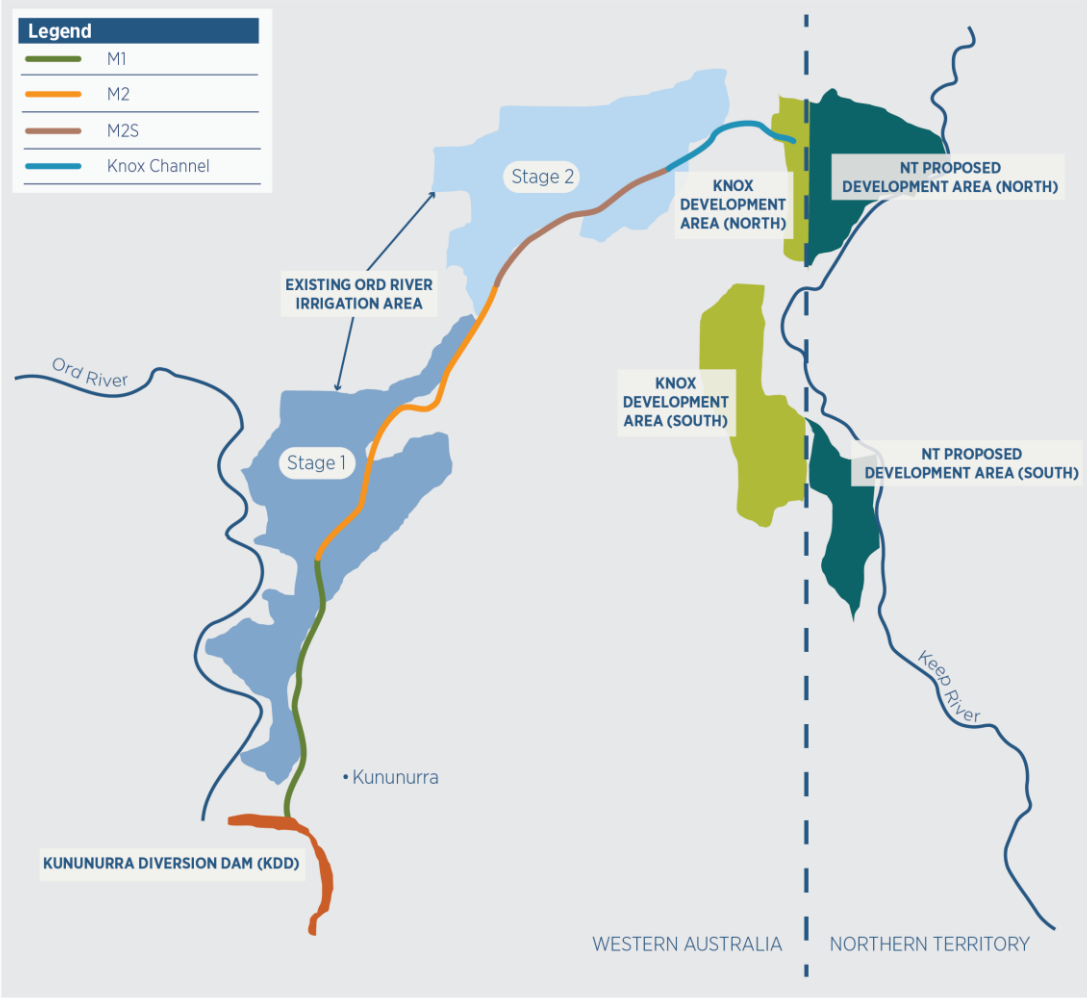


Figure 1: Ord Irrigation Scheme overview

Stage 1 of the ORIS, established in the mid-1960s, comprised the development of 14,000 ha (approx.) on the banks of the Ord River. Water is diverted at Kununurra Diversion Dam (KDD) into the 17.3 km M1 Channel and provides irrigation water through a series of supply channels and offtakes.

Stage 2 of the ORIS (Ord Irrigation Expansion Project) allowed for the expansion of up to 35,000 ha for irrigation. The work was completed in three phases:

- Phase 1 – Construction of the M2/M2S Channel to supply Stage 2 (completed 2011).
- Phase 2 – The widening of a section of the M1 channel to Supply ORIS Stage 1 (completed 2014).
- Phase 3 – Further widening of a portion of the M1 Channel by 6 km. WA's Water Corporation is delivering investment to ensure agreed levels of service are maintained.

The Knox Channel was built by a private developer to supply the Knox Development Area.

Options long list

The consulting team of Marsden Jacob Associates, Pinion Advisory and Indigenous Professional Services Management Consultants (IPS), in collaboration with the NT and WA[5] governments, developed and investigated a comprehensive long list of feasible options.

The long listed options were developed through desktop research, interviews and consultation with Traditional Owners, government and private sector stakeholders, site visits, and a rapid cost benefit analysis (CBA) (Figure 2). Each option explored a range of scheme infrastructure and non-infrastructure investments.

Figure 2: Option development approach

Each long listed option was designed:

- To expand the existing ORIS into the NT, where it will deliver a reliable water supply for up to 24,000 ha in both the NT and WA that is highly suited to irrigated agriculture.
- To efficiently address the challenges and maximise the benefits discussed in this section of the report.
- With consideration of four strategic investment themes (Table 1).

[5] Represented by the Department of Primary Industries and Regional Development (DPIRD)

Table 1: Strategic investment themes

Theme	Description
Store off peak flows	Investment in on farm storage on new development in the NT, enabling off peak flow to be stored for use in irrigation season.
Optimise delivery	Optimised water delivery to existing ORIA enables larger peak flow volumes to new development in NT. Size of on farm storages reduced as a result.
Increase channel capacity	Investment in increasing channel capacity by refurbishing existing channels or constructing additional channels, enabling larger volumes to be supplied to new developments in irrigation season.
Piped system to supply elevated areas	Invest in a piped system to supply elevated areas that cannot be supplied by channels, enabling expansion of feasible development area in NT and WA.

Options evaluation workshop

The options evaluation workshop was held in Darwin on 10 November 2023. The workshop was:

- Undertaken in line with Infrastructure Australia's Assessment Framework[6] and the National Water Grid Investment Framework[7].
- Attended by representatives from the NT, WA[8] and Australian[9] Governments, Marsden Jacob Associates, Pinion Advisory and IPS.

Participants were provided with the long list of 11 feasible options in advance of the workshop (Table 2).

Table 2: Options long list summary

Long List Option Name	Volume (GL/year)	Supply Period
Option 1: Knox channel (full storage required)	40 GL	Wet Season
Option 2: Pipeline constructed from existing Ord to NT (full storage required)	40 GL	Wet Season
Option 3: Pipeline constructed from existing Ord to NT (full storage required)	160 GL	Wet Season
Option 4: New channel with Ord augmentation/upgrade	160 GL	Dry Season
Option 5: New channel with on farm augmentation	160 GL	Dry Season
Option 5a: Minor Knox upgrade with on farm augmentation	40 GL	Dry Season
Option 6: Kununurra Diversion Dam (KDD) pipeline (bypass Ord)	40 GL	Dry Season
Option 7: KDD pipeline (bypass Ord)	160 GL	Year Round
Option 8: Hybrid 1 – combination of Option 1 and 6	40 GL	Dry Season
Option 9: Hybrid 2 – combination of Option 1 and 7	160 GL	Year Round
Option 10: Duplication pipeline from KDD to NT	40 GL	Dry Season

[6] Stage 2 - Identifying and analysing options | Infrastructure Australia
[7] Funding National Water Grid
[8] Department of Primary Industries and Regional Development.
[9] Department of Climate Change, Energy, the Environment and Water.

Options evaluation and shortlisting

Participants discussed and evaluated the 11 options:

- Using Infrastructure Australia's Guide to Multi Criteria Analysis. [10]
- Based on technical, economic, governance/political, sociocultural, environmental and legal criteria.
- Against the NWGF's core critical success factors:
  - Has a demonstrable public benefit and a national interest element.
  - Addresses circumstances that cannot be effectively addressed by proponents, states, territories and stakeholders alone.
  - Avoids water supply for exclusive use to a single entity, or for the primary benefit of one major customer.

Three options were selected for detailed evaluation:

- Option 1 = Long list option 9
- Option 2 = Long list option 4
- Option 3 (a&b) = Long list option 1.

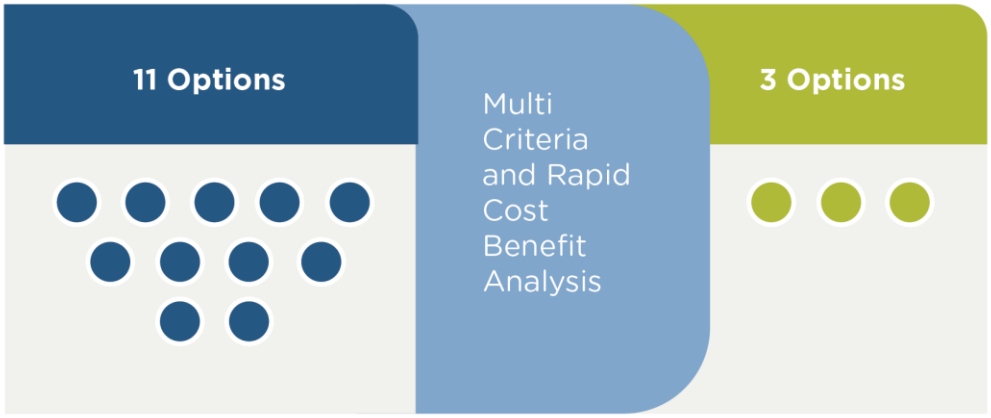


Figure 3: Options short listing process

[10] Assessment Framework 2021 Guide to multi-criteria analysis (infrastructureaustralia.gov.au).

Shortlisted options

Each of the short-listed options[11] (Figure 4) present a unique approach to expanding the area under irrigation in the Ord region and catering to agricultural development needs in the NT and WA.

	1 Knox channel and pipelines from Lake Kununurra	2 M1 Duplication channel	3a Short channel with on farm storage	3b Long channel with on farm storage
Scope	• 1.2km extension to NT border • 104kms of pumped pipeline	• 18km channel parallel to M1 connecting to M2 • 8.5km channel from end of M2S to NT border, parallel to Knox channel	• Agreement to share Knox channel capacity • 1.2km extension to NT border	8.5km channel from end of M2S to NT border, parallel to Knox channel
Infrastructure goes to	• Cockatoo Sands South • Ivanhoe Plain • NT North and South	• NT North	• NT North	• NT North
Area developed	Up to 24,000 ha	Up to 15,300 ha	Up to 15,300 ha	Up to 15,300 ha
Farm storage	15 GL	5 GL	30 GL	30 GL
Draws water from existing scheme in	Dry season	Dry season	Wet season	Wet season
Volume to NT	• Package 1 <= 80 GL/yr. • Package 2 <= 160 GL/yr.	• Initially <= 80 GL/yr. • At ultimate <= 160 GL/yr.	Capacity up to 160 GL/yr.	Capacity up to 160 GL/yr.

Figure 4: Short listed options

[11] NB: Two sub-options were explored for Option 3.

Option 1 – Knox Channel and Lake Kununurra Pipeline

Concept[12]

This concept proposes delivering peak irrigation demand to the farm gate during the dry season, which will minimise on-farm storage. The concept will be delivered in two 'packages' to meet short-, medium- and long-term irrigation demand (Table 3).

Package 1 aims to supply water to both NT (North) and NT (South).

The existing ORIS channel network would be utilised to supply NT (North). This would involve extending the existing Knox channel[13] to the NT border, a distance of 1.2 kms, enabling up to 80 GL/pa to be supplied to NT (North).

The NT (South) area sits higher than the Kununurra Diversion Dam (KDD), which means the existing gravity-fed ORIS channel cannot deliver water to it. Package 1 would solve this issue:

- By pumping water from the KDD to the NT (South) through a 36 km pipeline.
- Through the construction of a separate 30 km pipeline to supply the Knox Development Area (South).

Package 1 can also support the development of the Cockatoo Sands Development Area (South). Either pipeline can supply irrigation water to the area if supplemented by a 2 km offtake pipeline.

Package 2 proposes a second 36 km pumped pipeline to NT (South). This would be constructed in response to demand for additional irrigation supply in the NT (South) and/or the Knox Development Area (South) (Figure 5). Package 2 could also support the development of other areas in WA situated near the pipeline, such as Ivanhoe Plain.

Developments in the Keep River Catchment will require tailwater recycling and sufficient storage to capture the first 25 mm of rainfall. Tailwater recycling uses ditches, dams, and pumps to collect and reuse irrigation water and rainfall runoff. This system will protect the Keep River from potential contamination by organic matter, fertilizer, and other farm chemicals.

At full development, this concept could support the development of 24,000 ha for irrigated agriculture in the NT and WA.

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12 Longlist Option 9.

13 A separate 1.2 km offtake from the channel would be constructed as part of Package 1 to enable a larger area of the Knox development area (North) to be irrigated, but this would be funded separately from this business case.

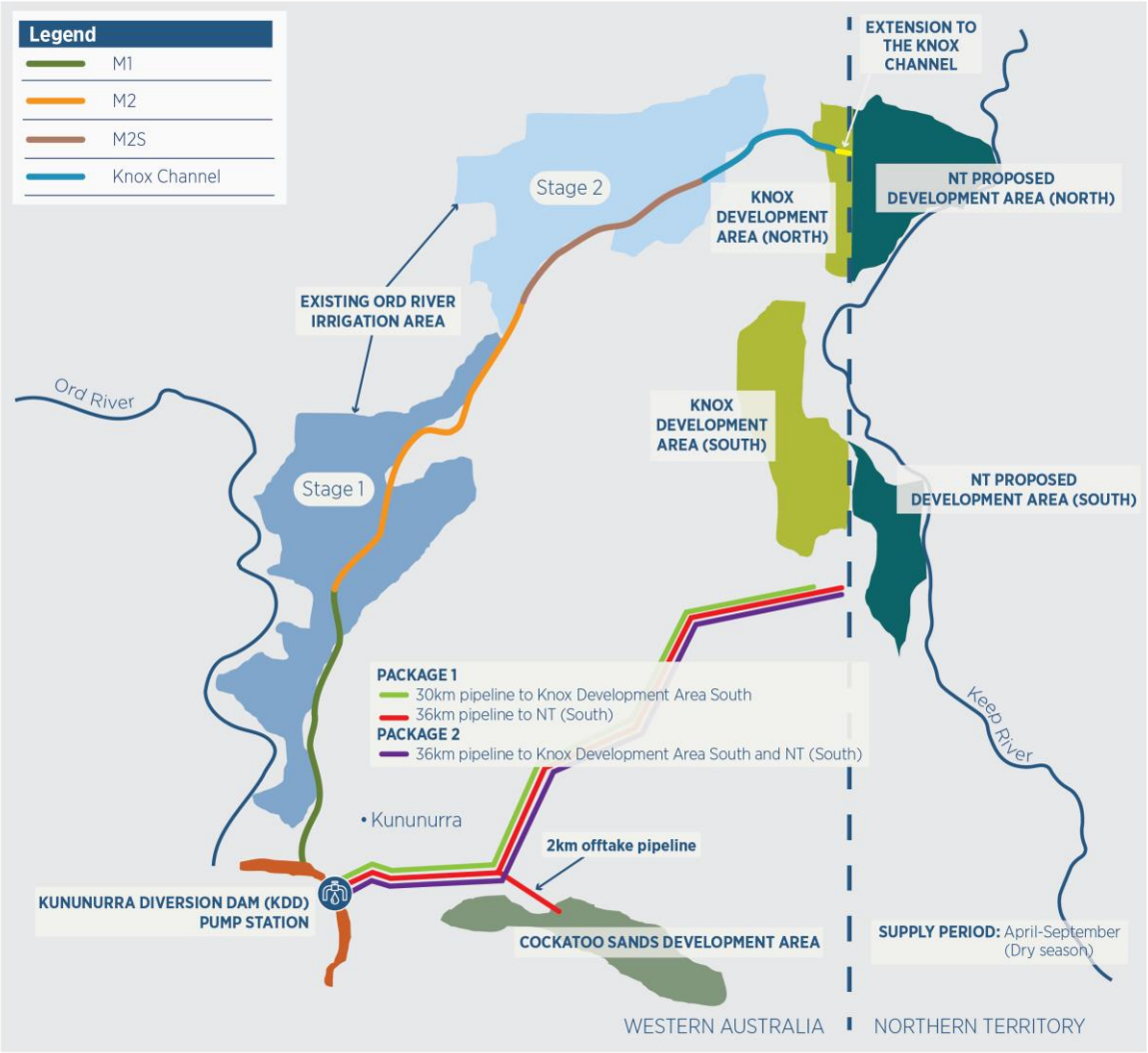

Figure 5: Option 1 schematic

Table 3: Option 1 summary

Element	Description
Concept scope	Package 1: • 1.2k m extension of existing channel to supply NT (North) • 1.2k m (approximately) offtake channel from existing channel to supply Knox development area (North) • 36 km pumped pipeline from Kununurra Diversion Dam (KDD) to supply NT (South) • 30 km pipeline connected to Kununurra Diversion Dam (KDD) to supply Knox development area (South) via a 6 km offtake channel • 2k m (approximately) offtake pipeline to supply Cockatoo Sands South Package 2: • 36km pumped pipeline from KDD to supply additional volume to NT (South) and Knox development area (South)
Major infrastructure elements	• 104 kms of new pipeline drawing from Lake Kununurra • 7.6 MW pump station delivered in two packages • 8.4 kms of new channel extensions and offtakes
Supplies to	NT: • North development area • South development area WA: • Knox development area (North) • Knox development area (South) • Cockatoo Sands South[14] • Ivanhoe Plain.
Irrigated land developed	Up to 24,000 ha: • 17,000 ha in NT • 7,000 ha in WA.
Farm storage	15 GL
Supplies during	Dry season
Volume to NT	Package 1: • NT North <= 40 GL/pa • NT South <= 40 GL/pa Package 2: • NT North <= 40 GL/pa • NT South <= 40GL/pa
Volume to WA	Package 1: • Knox Development Area North and South <= 55 GL/pa • Cockatoo Sands South <= 20 GL/pa Package 2: • Knox Development Area North and South <= 35 GL/pa • Ivanhoe Plain – potential volume to be determined closer to time of development

[14] Also known as Cockatoo Sands (Victoria Highway).

Delivery and operation model

The main infrastructure assets and water sources are located in WA. As per current governance arrangements, the WA Government will be responsible for:

- Infrastructure through the Department of Primary Industries and Regional Development (DPIRD) and the Water Corporation.
- Water allocations and licencing through the Department of Water and Environmental Regulation (DWER).

The NT Government and NT development proponents are customers of the expanded ORIS.

The NT and WA governments are aware that additional governance arrangements are required for new infrastructure assets and water allocations. These arrangements will be determined if this option progresses to development.

Option 1's delivery and operation model is summarised in Table 4. The delivery and operation cost assumptions are outlined in Table 5.

Table 4: Option 1 delivery and operation model

Asset	Jurisdiction	Delivered by	Funded by	Operated by	Cost recovery
On-farm infrastructure including storage	WA	Private proponent	Private proponent	Private proponent	N/A
On-farm infrastructure including storage	NT	Private proponent	Private proponent	Private proponent	N/A
Extension of the Knox channel to the NT border (1.2km)	WA	Keep Farming Pty Ltd	NT private proponent	NT private proponent	• Channel maintenance and renewal by agreement between Keep Farming and NT proponent. • Ord Irrigation Bulk Water charge and maintenance fee to be paid by NT proponent to the Ord Irrigation Cooperative as per current arrangements.
New piped system to service Cockatoo Sands, Knox South and NT (South) Developments	WA	• DPIRD • Water Corporation • Third party entity	WA, NT and Australian governments	• Water Corporation • Third Party • Traditional Owner Corporation	• Bulk water charges based on cost recovery principles currently used by the WA Government. • Asset operating and maintenance costs may be recovered through bulk water and maintenance charges or subsidies from the WA and NT governments.

Table 5: Option 1 delivery and operation assumptions

Element	Cost ($M, 2024)
Total capital costs[15]	$541.89 M (2024)
Fixed operating costs[16]	$1.28 M (2024)
Variable operating costs[17]	$2.20 M first year $6.94 M at full
On-farm development capital costs (median)	$12,824 ha

Source: MJA analysis 2023, some elements based on advice from Pinion Advisory

[15] Capital costs include 10% owners' costs, 15% design and planning costs, and 35% contingency. Does not include private funding for Knox offtake channels or Cockatoo Sands development area distribution infrastructure.

[16] Fixed operating costs include scheme operations, administration and overheads, repairs and maintenance, and miscellaneous costs, and annual allowances for asset renewal.

[17] Variable costs include energy costs for offtake and pump stations at a weighted average of $0.1578/kWh per WA Government tariffs.

Option 2 – Duplication of M1 Channel

Concept[18]

This concept (Figure 6) proposes delivering peak irrigation to the farm gate during the dry season, and requires minimal on-farm storage. This is achieved by constructing a new channel to extend the M2S channel to the NT border, enabling the transfer of water to NT (North).

This concept will maintain existing levels of service in the ORIS by constructing a new offtake from Lake Kununurra to supply an 18 km M1 duplicate channel within the existing M1 channel corridor. The new duplicate channel, which will operate under gravity, will connect to the M2 channel and effectively bypass the infrastructure supplying water to ORIA Stage 1.

The M2 channel's control structures will need to be upgraded to manage the increased volumes of water delivered into it. With more water available, additional irrigated farming could be developed in areas already connected to the M2 channel.

As with Option 1, developments in the Keep River Catchment will require tailwater recycling and sufficient storage to capture the first 25 mm of rainfall.

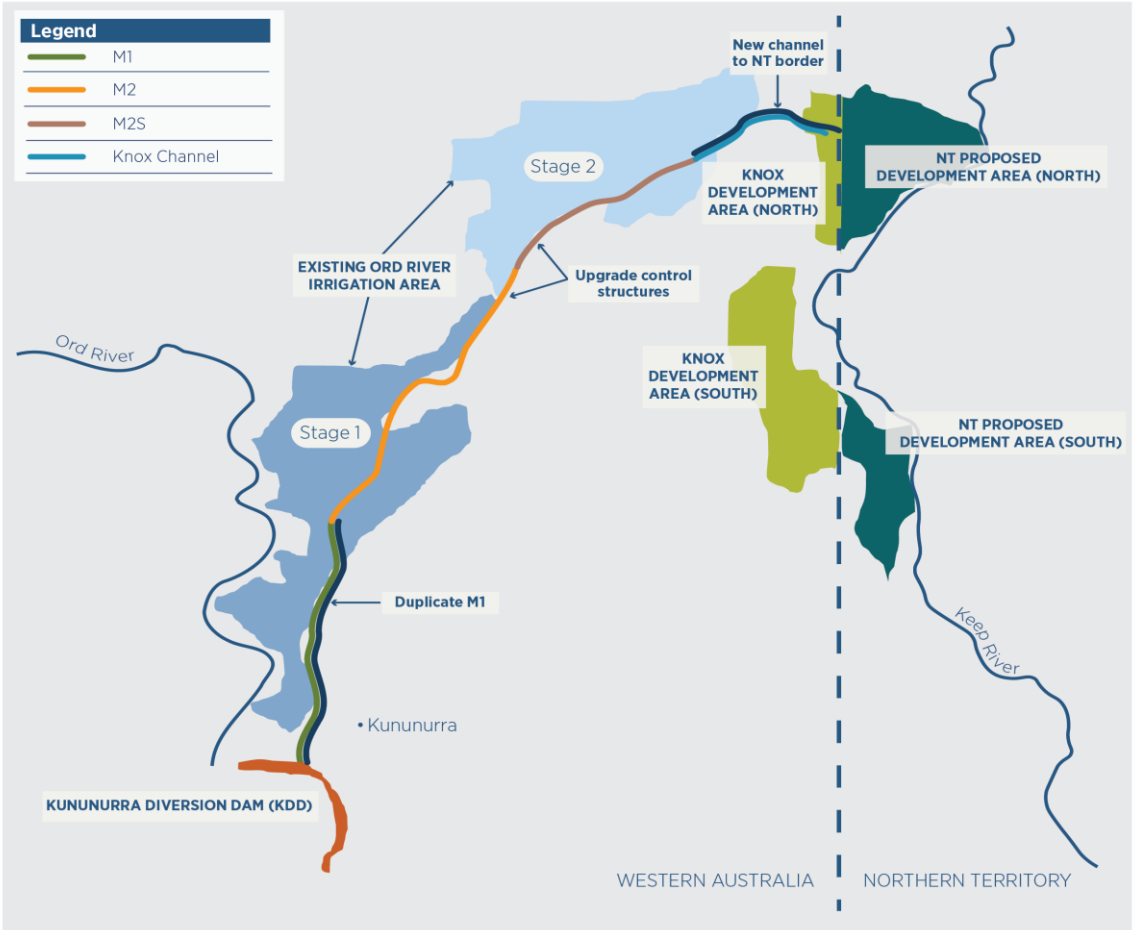

Figure 6: Option 2 schematic

[18] Longlist Option 4.

Table 6: Option 2 summary

Element	Description
Concept scope	• New 18 km channel parallel to M1 and connecting to M2. • 8.5 km channel from the end of M2S to the NT border.
Major infrastructure elements	• 8.5 km earthen channel to the NT border. • New channel crossing and outlet structure. • New Lake Kununurra offtake. • New 18 km channel from the offtake. • New control structures for the new channel. • M2 and M2S existing channel control structure upgrades.
Supplies to	NT (North)
Irrigated land developed	Up to 15,300 ha
Farm storage	5 GL
Supplies during	Dry season
Volume to NT	• Initially <=80 GL/pa • At ultimate <=160 GL/pa

Delivery and operation model

The delivery and operational models are the same as for Option 1, with the main infrastructure assets and water sources located in WA. As for Option 1 and current governance arrangements, the WA Government will be responsible for asset delivery and water allocations.

The NT Government and NT development proponents will be customers of the expanded ORIS.

The NT and WA governments are aware that additional governance arrangements are required for new infrastructure assets and water allocations. These will be determined if this option progresses to development.

The channel extension can be owned by WA's Water Corporation, keeping asset ownership across the ORIS in the public domain. Private proponents would privately fund on-farm infrastructure.

Option 2's delivery and operation model is summarised in Table 7. The delivery and operation cost assumptions are outlined in Table 8.

Table 7: Option 2 delivery and operation model summary

Asset	Jurisdiction	Delivered by	Funded by	Operated by	Cost recovery
On-farm infrastructure including storage	WA	Private proponent	Private proponent	Private proponent	N/A
On-farm infrastructure including storage	NT	Private proponent	Private proponent	Private proponent	N/A
Construction of a new channel from M2S to NT border (8.5 km)	WA	• DPIRD • Water Corporation	WA, NT and Australian governments	Existing water service provider as per current arrangements	• Maintenance and renewal by agreement between Keep farming and NT proponent • Ord Irrigation Bulk Water charge and maintenance fee to be paid by NT proponent to the Ord Irrigation Cooperative as per current arrangements
New offtake at Lake Kununurra, new channel parallel to M1, and control structure upgrades.	WA	• DPIRD • Water Corporation • Third party entity	WA, NT and Australian governments	Existing water service provider as per current arrangements	• Bulk water charges based on cost recovery principles currently used by the WA Government • Asset operating maintenance costs may be recovered through bulk water and maintenance charges, or subsidies from the WA and NT governments • The National Water Initiative pricing principles may also be considered

Table 8: Option 2 delivery and operation cost assumptions

Element	Cost ($M, 2024)
Total capital costs	$188 M (2024)
Fixed operating costs	Not quantified
Variable operating costs	Not quantified
On farm development capital costs (median)	$11,143 ha

Source: *MJA analysis 2023, some elements based on advice from Pinion Advisory*

Option 3 – Channel with off-scheme storage

Concept[19]

In contrast to Option 2, this concept proposes delivering irrigation to the farm gate during the wet season. This requires more on farm storage than Option 2, with water being drawn from the existing ORIS during the wet season for use during the dry season.

As with Options 1 and 2, developments within the Keep River Catchment will require tailwater recycling and sufficient storage to capture the first 25mm of rainfall.

This concept (Figure 7) connects the proposed NT (North) development area to the existing ORIS. Two sub-options were investigated:

- Option 3a, which involves:
  - extending the existing Knox channel (end of M2S) to the NT border.
  - approximately 1.2 km of new channel construction.
- Option 3b, which involves constructing a parallel channel, approx. 8 km long, from the end of M2S to the NT border. This channel will be parallel to the existing Knox channel.

Both sub-options require the construction of on-farm storage (approximately 30GL capacity).

Options 3a and 3b achieve the same outcomes by enabling:

- Up to 160 GL/pa to be supplied to the NT
- Supply to both NT (North) and NT (South)
- Development of up to 15,300 ha of irrigation land
- Irrigation in the dry season by drawing water from the ORIS in the wet season.

[19] This is Longlist Option 1.

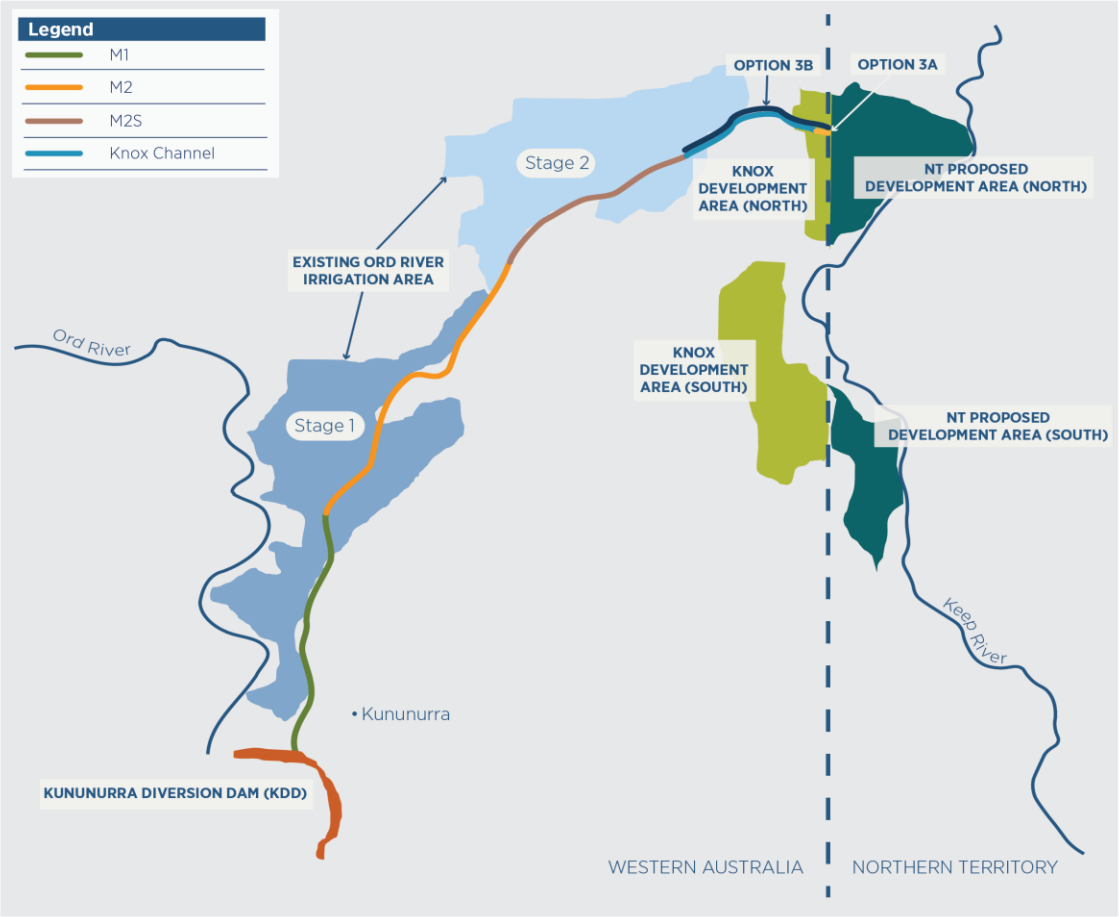

Figure 7: Option 3 schematic

Delivery and operation model

The delivery and operational models are the same as for Options 1 and 2, with the main infrastructure assets and water sources located in WA. However, Option 3 requires minor augmentations to the existing ORIS infrastructure.

As per current governance arrangements, the WA Government will be responsible for asset delivery, water allocations and licencing.

The NT Government and NT development proponents will be customers of the expanded ORIS.

The NT and WA governments are aware that additional governance arrangements are required for new infrastructure assets and water allocations. These will be decided if this option progresses to development.

Option 3's delivery and operation model is summarised in Table 9. Delivery and operation cost assumptions are outlined in Table 10.

Table 9: Option 3 delivery and operation model summary

Asset	Jurisdiction	Delivered by	Funded by	Operated by	Cost recovery
On-farm infrastructure including storage	NT	Private proponent	Private proponent	Private proponent	N/A
Option 3A: Extension of the Knox channel to NT border (1.2 km)	WA	Keep Farming Pty Ltd	NT private proponent in agreement with Keep Farming	NT private proponent	• Channel maintenance and renewal by agreement between Keep Farming and NT proponent • Ord Irrigation Bulk Water charge and maintenance fee to be paid by NT proponent the Ord Irrigation Cooperative as per current arrangements
Option 3B: Construction of a new channel from M2S to NT border (8.5 km)	WA	DPIRD Water Corporation	WA, NT and Australian governments	Existing water service provider as per current arrangements	• Channel maintenance and renewal of by agreement between Keep Farming and NT proponent • Ord Irrigation Bulk Water charge and maintenance fee to be paid by NT proponent the Ord Irrigation Cooperative as per current arrangements

Table 10: Option 3 delivery and operation cost assumptions

Element	Cost ($M, 2024)
Total capital costs	$26.03 M (2024)
Fixed operating costs	$4.23 M (2024)
Variable operating costs	$0.55 M (2024)
On farm development capital costs (median)	$14,496/ha

Economic, financial and net benefit assessment

To be considered for Australian Government funding through the NWGF, projects must meet the Fund's eligibility criteria, satisfy its investment principles, and demonstrate alignment with its Investment Framework.

For this PBC, a structured framework was used to assess whether NWGF investment in the Ord Expansion project is justified. This assessment framework focused on two fundamental, yet independently insufficient, conditions for justifying government investment:

- Financial viability of private sector entities in the irrigation scheme:
  - Private sector participants must generate adequate free cash flow to cover their capital and operational expenses. Absence of this financial viability undermines the fundamental rationale for investment.
- Public benefits beyond farmgate:
  - In addition to being financially viable for private sector participants, projects must demonstrate public benefits beyond individual farms to the broader community and economy.

Satisfaction of these conditions provides assurance to the NT and Australian governments that government investment in the Ord Expansion project is justified.

Condition 1 – Financial viability

Scenarios

The commercial viability of irrigation enterprises is dependent on:

- The pace of development.
- The crop mix strategies used.
- Farm development and operational costs.

The three shortlisted options were assessed under four scenarios (Figure 8) to provide insights into outcomes under different crop mix strategies[20] and pace of development. These were:

- An all broadacre crop strategy – in this case a specialisation in cotton, which has proven successful in other ORIS enterprises. [21]
- A broadacre 'plus' strategy – in this case cotton plus a range of high value, but labour intensive, horticultural crops that have been successful across the ORIS (e.g., maize, plus watermelons and mangoes).

[20] Representing the endpoints of a spectrum of crop mix strategies.
[21] Profitability was calculated using a range of maximum planted areas along with the assumed gross margins and on-farm water usage, expressed on a per ha basis. The Gross Margin for all broadacre strategy was based 2023/24 CottonInfo/AgEcon Northern Australia Furrow Irrigated Cotton Gross Margin Budget.

- Full and rapid development – which assumed that, where possible, irrigators develop land as quickly as possible, with the first 1,000 ha developed by FY 2028, and first water taken in FY 2029. [22]
- Full and phased development – which assumed that development will be phased and slower at 400 ha per year, 1st water is accepted in FY 2029, irrigators periodically pause development, and the final phase of development occurs from FY 2042. [23]

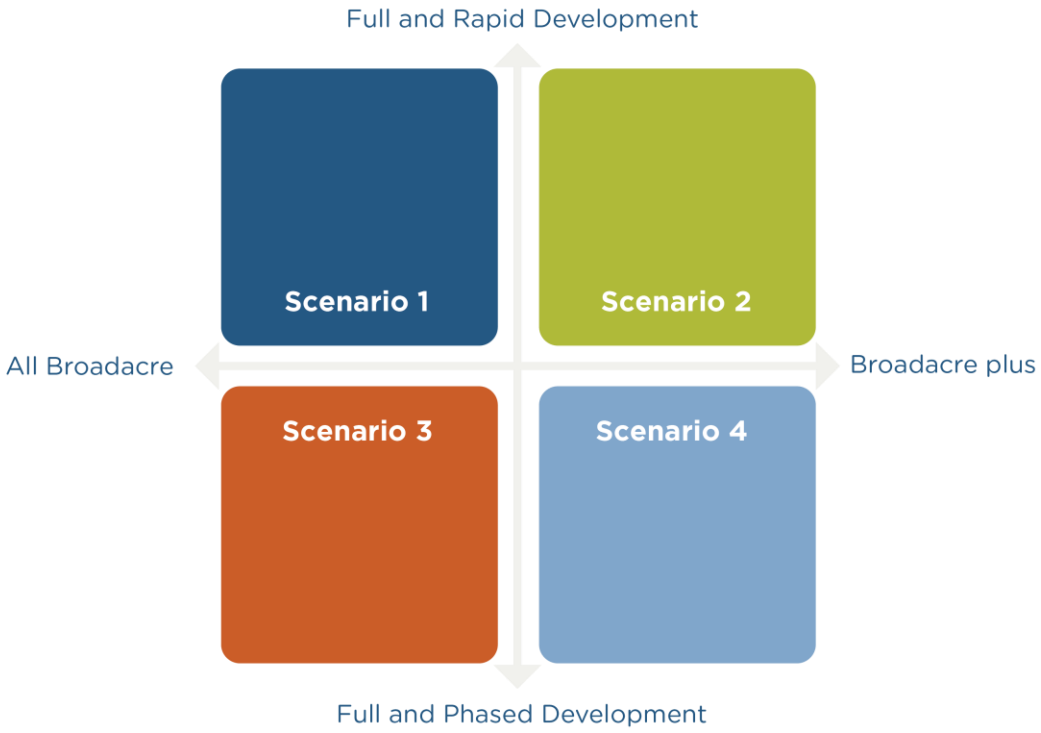

Figure 8: Matrix of commercial viability scenarios

[22] This was not possible for Option 1, where a three-year approval and planning phase was assumed,
[23] Only Option 1 can be staged this way, which is an advantage of using pipeline over channels. Stage 2 of Option 1 is timed matched to this to allow 1st water to be delivered by 2043.

Farm development costs

Table 11 summarises the on-farm development costs for each option under a broadacre cropping strategy.

Table 11: On-farm development costs - broadacre cropping strategy

Item	Option 1		Option 2		Option 3	
	$m	$ / ha	$m	$ / ha	$m	$ / ha
Property[24] and irrigation[25] development	150.6	8,861	130.6	7,685	197.1	11,596
Design & Planning	22.6	1,329	39.2	1,153	29.6	1,739
Contingency	45.2	2,658	19.6	2,305	19.7	1,160
Total Cost	218.0	12,824	189.4	11,143	246.4	14,496

Source: MJA analysis 2023, some elements based on advice from Pinion Advisory

Viability under each scenario

Under various assumptions, and accounting for volatility of returns and investment risks, all but one of the option-scenario combinations were found to be financially viable (Table 12).

Table 12: NPV[26] of free cashflow ($m) applying a discount rate of 10% (real) under each Scenario

Scenarios	Option 1	Option 2	Option 3
Full & Rapid + All Broadacre (S1)	17.5	74.6	47.8
Full & Rapid + Broadacre Plus (S2)	9.7	58.7	40.7
Full & Phased + All Broadacre (S3)	17.6	74.6	47.3
Full & Phased + Broadacre Plus (S4)	40	(32)	24.4

Source: MJA analysis 2023

It should be noted that if infrastructure access charges or other charges are imposed to recoup the PV capital costs, the financial viability of these ventures would be compromised, which could deter investment in farm development.

Condition 2 – Public benefit beyond farmgate

The Ord River Expansion project's economic benefits were rigorously tested through multiple sensitivity analyses. The analyses comprised nine tests using four variables and a combination of adverse conditions. [27] The nine tests were applied to the four project scenarios, with 36 combinations modelled.

[24] Land clearing and grubbing, roading & access, power, Levees/flood protection, structures, other property improvements, machinery and farming equipment.

[25] Field - surface (80%), field - o/head sprinkler (20%), on-farm storage, internal delivery (channels/pipelines), internal drainage (Tail water return), pump stations (relicts/tailwater returns), Keep River syphon/crossing structure.

[26] Calculated assuming net margins for each crop type based on expected average outcomes. Net margins incorporate conservative estimates for overhead costs and account for farm development costs.

[27] The variables and conditions included: Discount Rate Variations at 4% and 10%. Gross Margins Fluctuations of 10% higher and lower. Capital Cost Estimates at P95 & P50 levels. Operating Cost Adjustments of 10% higher and lower. "Extreme" Combination combining P95 capital costs with 10% higher operating costs and 10% lower gross farm margins.

Economic results for the central case

The economic costs and benefits for each option, under central case assumptions (Table 13), are summarised in Table 14. The net benefits of each option were assessed using a standard cost benefit framework.

Table 13: Central case assumptions

Central case assumptions		
Discount rate of 7% real dollars [28]	30-year evaluation period [29]	P90 costs
Present value lifecycle costs (PVC) = future capital and operating costs discounted at 7% real dollars.	Present value lifecycle benefits (PVB) = future benefit streams discounted at 7% real dollars.	Net present value (NPV) of implementation = PVB – PVC.

PVCs, PVBs and NPVs provide useful metrics for investment decision makers. A positive NPV indicates that the option will be worthwhile for society. The ratio of the PVBs to PVCs – the Benefit Cost Ratio (BCR) – shows the proportion by which benefits exceed costs.

From an economic point of view, any option with a positive NPV is worthwhile to society. Options with a positive NPV and a BCR above 1 will generate net benefits.

Table 14: Economic outputs under central case assumptions

Component	Present Values ($m)		
	Option 1	Option 2	Option 3
Benefits[30]			
Agricultural benefits	310.24	255.32	255.32
Avoided costs	17.29	0.00	0.00
Total Benefits	327.52	255.32	255.32
Costs[31]			
Project capital	641.90	215.33	169.19
Total Opex	77.59	11.82	4.84
Total Cost	719.50	227.15	174.03
NPV	-391.97	28.17	81.29
BCR	0.46	1.12	1.47

Source: MJA analysis 2023, some elements based on advice from Pinion Advisory

[28] Sensitivity assessments were undertaken assuming 4 per cent and 10 per cent. The discount rates are as per Infrastructure Australia 2018 Assessment Framework.

[29] Evaluation over the scheme's economic life is not feasible with the number of design of options considered. The economic life will be applied in the Detailed Business Case.

[30] It was not feasible to quantify the Value of First Nations Wages, social benefits and the value of First Nations wages using design concepts. These will be covered in the Detailed Business Case.

[31] Environmental, social and cultural costs will be quantified in the Detailed Business Case.

It should be noted that although Option 1 has a lower NPV and BCR than Options 2 and 3, it is expected to deliver greater economic and cultural benefits to First Nations people. Option 1 is the only option that allows MG Corporation to develop a financially viable irrigated agriculture enterprise.

The additional advantages specific to Option 1 will be assessed in a Detailed Business Case.

Net benefits

The net benefits of each option – the 'with project' case – were evaluated against the 'without project' case[32] using a standard cost benefit framework.

Under all three options, the Ord River Expansion Project is expected to deliver economic returns, stimulate regional development, and create substantial direct and indirect employment opportunities. Much of this will flow to local and regional economies through increased demand for agricultural inputs, downstream processing and supply chains.

The project is expected to:

- Generate between $28.17 M and $81.29 M in direct economic benefits.
- Generate between $128 M[33] and $276 M[34] in value add to the Australian economy through agricultural output. Two-thirds will be direct value add (wages and profits of on-farm enterprises), and one-third will be in-direct value add through earnings in upstream and downstream enterprises.
- Generate significant economic value through construction and farm development activities, creating hundreds of jobs directly engaged in construction and associated sectors.
- Support between 1,291[35] and 2,781[36] FTEs across direct on-farm employment and indirectly across processing, production and supply chains.
- Improve socio-economic wellbeing outcomes for First Nations people and communities by generating education, training, employment and business opportunities that can lead to wealth creation, empowerment and self-determination.
- Drive sustainable economic growth in the Wyndham-East Kimberley and Victoria Daly Local Government Areas (LGAs), and the broader regional economy, through increased agricultural outputs and the project's ongoing operations.
- Enhance individual and community resilience to the financial, economic and social pressures that often arise during periods of low water availability.

There is a clear need and justification for public investment in the Ord River Expansion project. Although all options are financially viable, the returns to private sector irrigators are not sufficient to enable them to fully fund the required capital expenditure.

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[32] The Without Project case assumed that:
- The OIS remains at its current scope and scale.
- Augmentations to assets and infrastructure are negotiated on a cases by case basis, financed and funded by private sector enterprises.
- Land under irrigation is expanded incrementally and periodically, and subject to the financial circumstances of individual private sector proponents.
- Supply to Cockatoo Sands is not realised
- Supply to Ivanhoe Plain and Knox Plain from the south is foregone

[33] Options 2 and 3

[34] Option 1

[35] Options 2 and 3

[36] Option 1

Without government investment, the substantial public benefits that the project can deliver may be foregone.

Social impact and benefits

The social impact evaluation considered the potential positive and negative effects of the Ord River Expansion project, and identified opportunities to enhance or mitigate these impacts. The evaluation focused on:

- Identifying quality-of-life impacts[37] such as culture, living standards, learning and development, health and safety, and economic and social participation.
- Demonstrating alignment between the impacts, enhancements and mitigations, and national, state and territory objectives.
- The Timber Creek and Kununurra Unallocated Crown Lands (UCL), and the Wyndham-East Kimberley and Victoria Daly LGAs, as the communities and regions likely to be most impacted by the project.
- Traditional Owner and First Nations people, who are more marginalised and disadvantaged than non-Aboriginal people in the region.

The evaluation demonstrated that, on balance, the Ord River Expansion project can deliver more positive impacts than negative. The positive impacts will flow from the anticipated economic growth, development and skilled employment opportunities.

Prioritising access to these opportunities for First Nations peoples Access can deliver a range of benefits beyond income. Meaningful employment is foundational to improved health and wellbeing, empowerment, self-determination, and addressing immediate and intergenerational disadvantage. These outcomes are Closing the Gap priorities.

Improved socio-economic outcomes for First Nations people was key to government support for Ord Stage 2. However, the anticipated improvements were either unrealised or not sustained.

WA Government reviews of Stage 2 provide a good understanding of what can be done differently to achieve desired socio-economic outcomes. This includes:

- Engaging First Nations people in the project's design and delivery to ensure that potential opportunities match community aspirations, and that potential cultural impacts are appropriately managed.
- Leveraging procurement, employment and training policies to create targeted and specified opportunities for First Nations people and businesses.
- Leveraging HR, recruitment and retention policies to create targeted and specified professional development and career progression opportunities for First Nations employees.
- Implementing cultural safety policies and practices to ensure workplaces are safe for and supportive of First Nations employees and contractors.

[37] As per Infrastructure Australia's Assessment Framework.

Detailed Business Case Considerations

First Nations Engagement

IPS led the engagement with Traditional Owners and key stakeholder groups to understand their perspectives on the Ord River Expansion project. MG Corporation and the Northern Land Council (NLC) were the key contributors to the engagement process.

The engagement process focused on understanding cultural considerations, and community aspirations and concerns. These views informed the option short listing process.

Initial engagement suggested there are mixed views about the project at the community level. Some community members see the project as favourable and potentially beneficial. Others indicated that what is working now is sufficient for their current needs.

Some of the less favourable views may be a reflection on the development and outcomes of Stages 1 and 2 in WA. This includes views that:

- Previous developments have had limited positive economic impacts, and some negative cultural impacts, on First Nations communities.
- Communities were not actively, meaningfully and/or appropriately engaged in the project's design and development, or in local and regional economic opportunities.
- First Nations peoples' concerns and aspirations were overlooked or ignored in the final projects.

A range of external factors restricted IPS' capacity to undertake broad community consultation within the project's timeframe. These factors included coinciding with the Referendum on the Voice to Parliament and community shut down times.

However, the longer times allowed for developing a Detailed Business Case will enable further and extensive engagement with First Nations people and communities. This consultation will be undertaken in line with best practice, including:

1. Ensuring that the project team develops knowledge of local cultural protocols and general cultural awareness before undertaking further engagement. This includes timing engagement activities with cultural calendars.
2. Maintaining consistent and inclusive communication with First Nations stakeholders about the proposed expansion project.

Environmental, cultural heritage and regulatory assessments, and Native Title approvals

A desktop assessment was undertaken to identify the potential environmental and cultural heritage impacts of each option, and to inform considerations of further detailed investigations as part of a Detailed Business Case. NLC commented on potential cultural impacts of irrigated agriculture developments.

Cultural heritage assessment

The desktop cultural impacts assessment for the PBC focused on areas in the NT.

NLC representatives provided insights into the potential impacts of irrigated agriculture across the broader Keep River development, rather than those specific to the infrastructure alignments for the proposed options. NLC advised that proposed agricultural area:

- May be on the fence line of a functioning community.
- May contain Sacred Sites.
- Includes one of the region's only intact hunting grounds.

A detailed cultural heritage assessment, including an authority certificate from the NT Aboriginal Areas Protection Authority, will be considered as part of the Detailed Business Case.

Environmental assessment

The desktop environmental assessment for the PBC comprised a review of the Commonwealth Protected Matters Search Tool (PMST) and Natural Values Atlas (NVA).

This assessment identified significant flora and fauna values across the project area. Key among these were:

- Typhonium, which is a listed threatened plant species.
- Lake Kununurra and Lake Argyle, which are Ramsar Wetlands.

Detailed on-ground flora, fauna and vegetation assessments will be required once project plans and changes are finalised, and before finalising the works alignment.

Regulatory considerations

The three shortlisted options are subject to a range of legal and regulatory considerations, and complex and multiple approval requirements. These will be investigated through the Detailed Business Case.

The relevant environmental, land use, water, cultural heritage and Native Title instruments for each jurisdiction are summarised in Table 15.

Table 15: Summary of relevant legislative instruments

Area	Commonwealth	Northern Territory	Western Australia
Environment	*Environmental Protection and Biodiversity Conservation Act 1999*	*Environment Protection Act 2019*	*Environment Protection Act 1986* Environmental Protection Regulations 1987
Native Title	*Native Title Act 1993*	*Aboriginal Land Act 1978*	
Cultural Heritage	*Aboriginal and Torres Strait Islander Heritage Protection Act 1984* *Protection of Moveable Cultural Heritage Act 1986*	*Northern Territory Aboriginal Sacred Sites Act 1989* *Heritage Act 2011*	*Aboriginal Heritage Act 1972* *Heritage of Western Australia Act 1990*
Land use		*Crown Lands Act 1992* *Planning Act 1999* *Pastoral Lands Act 1992* *Northern Territory Planning Scheme 2020*	*Land Administration Act 1972* *Planning and Development Act 2005* Planning and Development (Local Planning Schemes) Regulations 2015
Water		*Water Act 1992*	*Rights in Water and Irrigation Act 1914* *Country Areas Water Supply Act 1947* *Water Services Act 2012* *Water Agencies Powers Act 1984*

Risk assessment

The three shortlisted options were assessed against the National Water Grid Investment Framework risk categories. The key risks identified are summarised and rated in Table 16.

This assessment found that the identified risks are manageable, and that there are no factors to preclude the shortlisted options from being progressed to a Detailed Business Case.

A full risk assessment will be undertaken as part of the Detailed Business Case.

Table 16: Risk assessment summary

Category	Risk	Option 1	Option 2	Option 3
Reputational	Local Management Arrangements	Low risk	Medium risk	High risk
	Cooperation of existing farms	Low risk	Medium risk	High risk
Economic	Uncertain / inaccurate demand profiles	High risk	High risk	Low risk
	Uncertain / inaccurate cost estimates	High risk	Medium risk	Low risk
	Hydrology inaccuracy	Medium risk	Medium risk	Medium risk
Socio cultural risk	Traditional Owner opposition	High risk	Low risk	Low risk
	Farming community opposition	Low risk	Low risk	High risk
Technical	Contractor competency	Medium risk	Medium risk	Low risk
Technical	Construction schedule	Medium risk	Medium risk	Low risk
	Materials availability	High risk	Medium risk	Low risk
	Suitable operating entity	High risk	Medium risk	High risk
	Inaccurate parameter estimates	Medium risk	Medium risk	Medium risk
Environmental	Threatened species	Medium risk	Medium risk	Medium risk
	Flooding impacts	Medium risk	Medium risk	Medium risk
	Salinity	Medium risk	Medium risk	Medium risk
Legal	Planning approvals	High risk	Medium risk	Medium risk
	Water allocations	Low risk	Low risk	Low risk
	Native Title	Medium risk	Low risk	Low risk
	Cross border legislation	Low risk	Low risk	Low risk

Low risk Medium risk High risk

Conclusions

The three shortlisted options allow for phased implementation (Figure 9). This phased approach offers flexibility, enabling adjustments and scaling to be made in response to evolving needs, financial viability and external conditions.

Each implementation stage lays the groundwork for subsequent development phases, ensuring a continuous progression towards the Ord River Expansion project's ultimate goal.

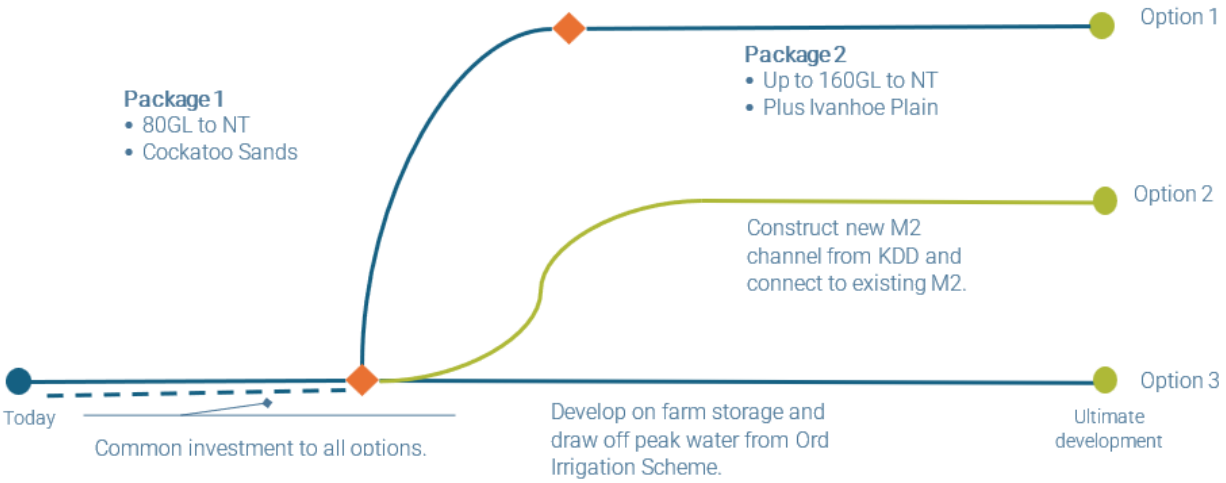


Figure 9: Adaptive pathways for each option

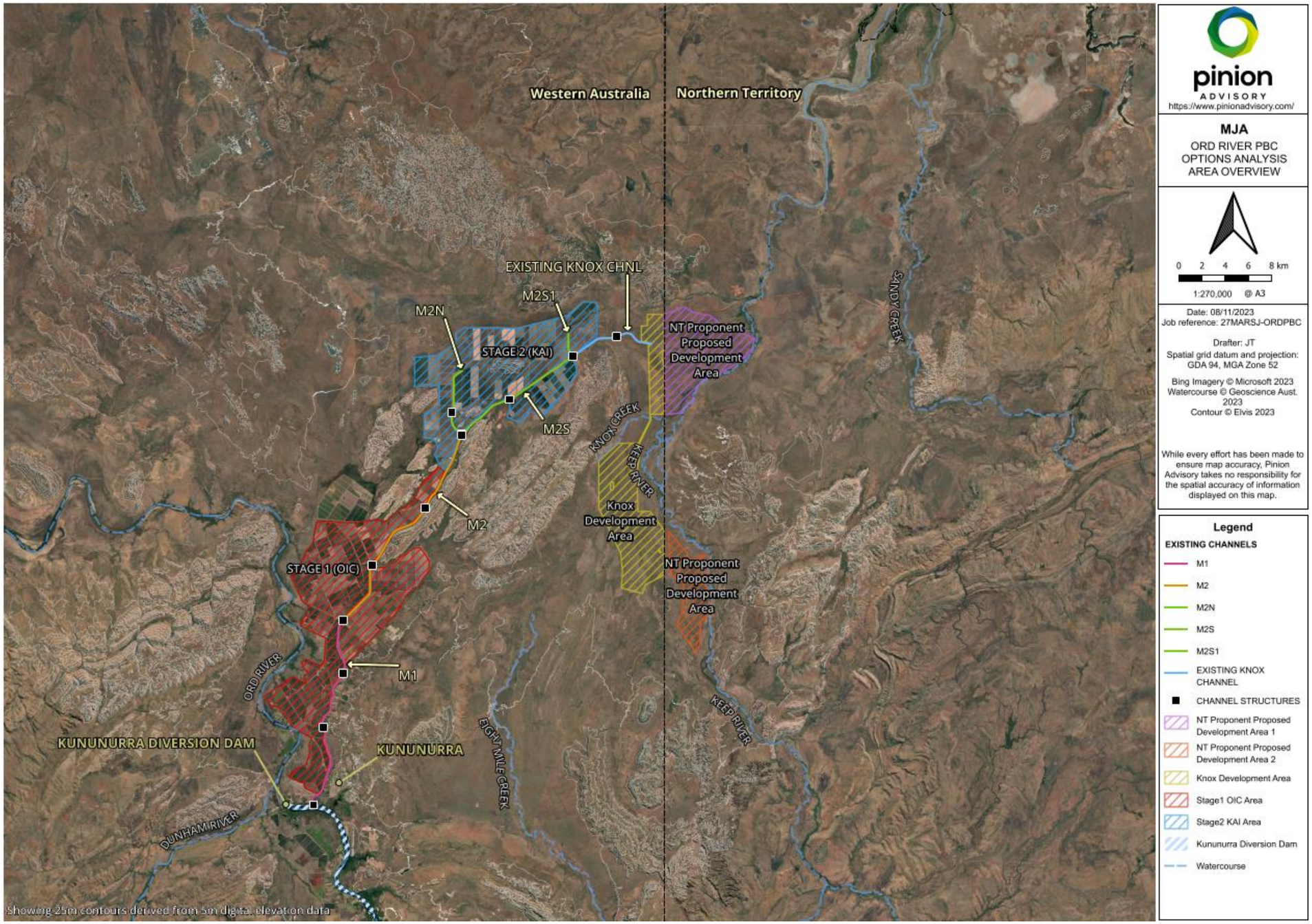
Recommendation: Construct the missing link between the M2S and the NT border

The missing link:

- Is a common investment to all options.
- Is a necessary component of and precursor to all three options, establishing the initial infrastructure needed to transfer water to the NT.
- Represents the first tangible step in actualising the transfer of water to the NT, laying the groundwork for the more extensive developments envisaged in each option.
- Is a cost-effective enabling component, providing the foundations for the project's scalable aspects and envisaged later developments.
- Can be delivered in two ways:
  - Constructing a 1.2 km extension to the existing Knox channel. This option may offer a more direct, and potentially quicker, route to achieve the initial connection.
  - Constructing an 8km channel from M2S to NT Border, parallel to the existing Knox channel. This option may involve more extensive construction, but may also have different strategic advantages in terms of capacity and long-term utility.
- Is flexible and non-limiting.

- The missing link is a non-exclusive step that keeps all shortlisted options viable, enabling the most suitable path to be taken as the Ord River Expansion project progresses.
- Has immediate and long-term utility.
- The missing link enables the transfer of sufficient water to meet immediate requirements and demonstrate the expansion project's feasibility, while ensuring its utility in the longer-term irrespective of the scaling option. As such, it provides a foundation for the project to be developed to its maximum scale and capacity.

Ord Irrigation Scheme Map



Glossary and acronyms

Glossary

BCR (Benefit Cost Ratio) - The ratio of the present value of benefits to the present value of costs. A BCR above 1 indicates that benefits exceed costs.

Broadacre crops - Crops grown on a large scale in fields, such as cotton, grains, or oilseeds.

Detailed Business Case - A comprehensive analysis of a proposed project that examines all aspects, including technical, economic, financial, environmental, social, and cultural factors, to determine its viability and make a final investment decision.

Horticultural crops - Crops grown for food or non-food purposes, such as fruits, vegetables, nuts, or ornamental plants.

M1 Channel - The primary irrigation channel in the existing Ord River Irrigation Scheme, servicing Stage 1.

M2 Channel – The channel downstream of M1 and the primary channel Servicing Stage 2.

M2N and M2S – Channels downstream of M2 and servicing the Goomig Farmland in Stage 2.

Net Present Value (NPV) - The difference between the present value of benefits and the present value of costs. A positive NPV indicates that the project will generate a net benefit.

Ord River Irrigation Scheme (ORIS) - The existing irrigation infrastructure network that delivers water from Lake Argyle to the Ord River Irrigation Area in Western Australia.

Present Value Benefits (PVB) - The discounted sum of future benefits associated with a project or investment.

Present Value Costs (PVC) - The discounted sum of future costs associated with a project or investment.

Traditional Owners - Indigenous Australians recognised as the original inhabitants and custodians of a particular land or area.

Acronyms

BCR	Benefit Cost Ratio
DPIRD	Department of Primary Industries and Regional Development (Western Australia)
DWER	Department of Water and Environmental Regulation (Western Australia)
FTE	Full-Time Equivalent
KAI	Kimberley Agricultural Investment
KDD	Kununurra Diversion Dam
LGA	Local Government Area
MG	Miriuwung Gajerrong
MJA	Marsden Jacob Associates
NLC	Northern Land Council
NPV	Net Present Value
NT	Northern Territory
NTPDF	Northern Territory Project Development Framework
NWGF	National Water Grid Fund
ORIS	Ord River Irrigation Scheme
PMST	Protected Matters Search Tool
PVB	Present Value Benefits
PVC	Present Value Costs
UCL	Unallocated Crown Land
WA	Western Australia

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