# MODERNISATION OF THE WEST CORURGAN PRIVATE IRRIGATION DISTRICT

Assessment against Socio-Economic Criteria as part of the Resilient Rivers Water Infrastructure Program

May 2025

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# Section 1: Overview

## 1.1. Project Summary

The Modernisation of the West Corurgan Private Irrigation District (WCPID) will significantly reduce current water losses associated with conveyance, improve the reliability and efficiency of water supply, bring significant economic activity to the area, provide substantial socio-economic and environmental benefits to the regional community, and importantly, provide the security of water supply which will act as an important stimulant for investment.

This project is a once in a generation opportunity for the WCPID to secure the future of itself, its members, and the region it services for the next 50 years and beyond.

### Current Situation

The WCPID is located in southern NSW and spans over 212,000 hectares between Berrigan and Corowa, encompassing several LGAs and Local Aboriginal Land Councils. The WCPID irrigation scheme is a pump and gravity-fed delivery system consisting of approximately 565 km of earthen channels. It delivers irrigation and stock and domestic water to around 270 licensed holdings via a 565km network of earthen channels. The system, based on the O'Dwyer Main channel (the backbone of the Scheme) and its laterals, suffers from inefficiencies in water delivery caused by conveyance losses and aging infrastructure. With approximately 80,000ML of water entitlements, the WCPID faces low delivery efficiency and high system losses. The modernisation of the scheme will improve the efficiency of the water delivery system.

The region supports diverse agricultural production, including irrigated winter cereals, maize, potatoes, rice and pastures, and dryland farming. Up to 20,000 hectares are irrigated annually, depending on water availability.

### Proposed Project

WCPID is proposing to implement a $154,630,255 project to modernise its ageing irrigation infrastructure, in conjunction with construction of a stand-alone piped and pressurised stock and domestic system, under the Resilient Rivers Water Infrastructure Program.

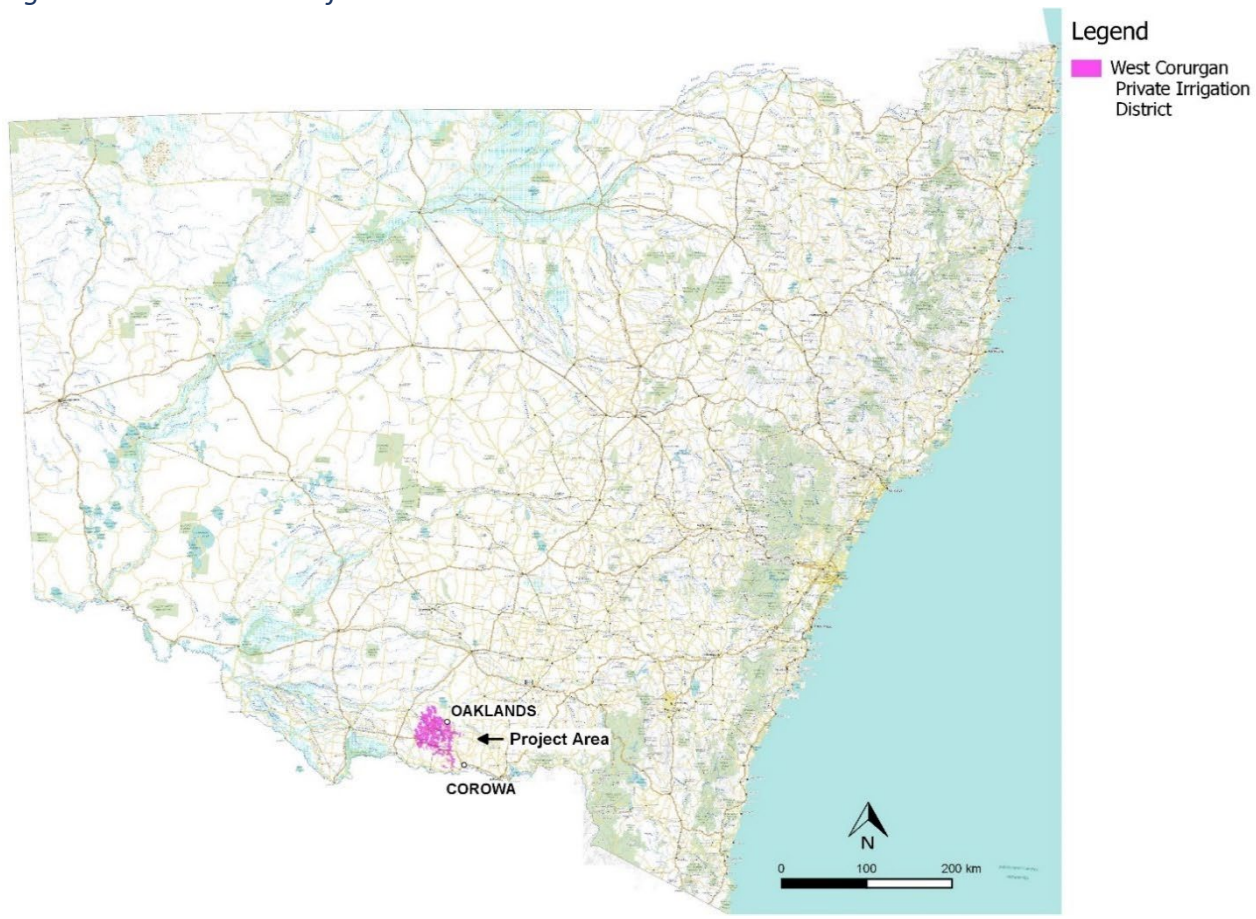
The project will result in 8,380ML of annual water savings, and a further rationalisation of 9,420ML of water entitlements – bringing total project water savings to 17,800ML. 100% of the savings will be transferred to the Commonwealth Environmental Water Holder (CEWH).

The project will involve the construction of over 500km of a stand-alone, piped stock and domestic water supply system (including pumps, pipes, valves and water treatment facilities), and the modernisation of the 565km of existing irrigation delivery infrastructure. Part of this modernisation will involve rationalisation and reconfiguration of 120km of the open earthen channel network, automation of the delivery network and replacement of non-compliant meters.

## 1.2. About the applicant

The WCPID services approximately 300 properties covering an area of around 212,000 hectares between the Murray River and the Billabong Creek. The area is bounded by the towns of Corowa, Daysdale, Oaklands, Jerilderie, Berrigan, Savernake and Rennie (***see Figures 1 and 2***).

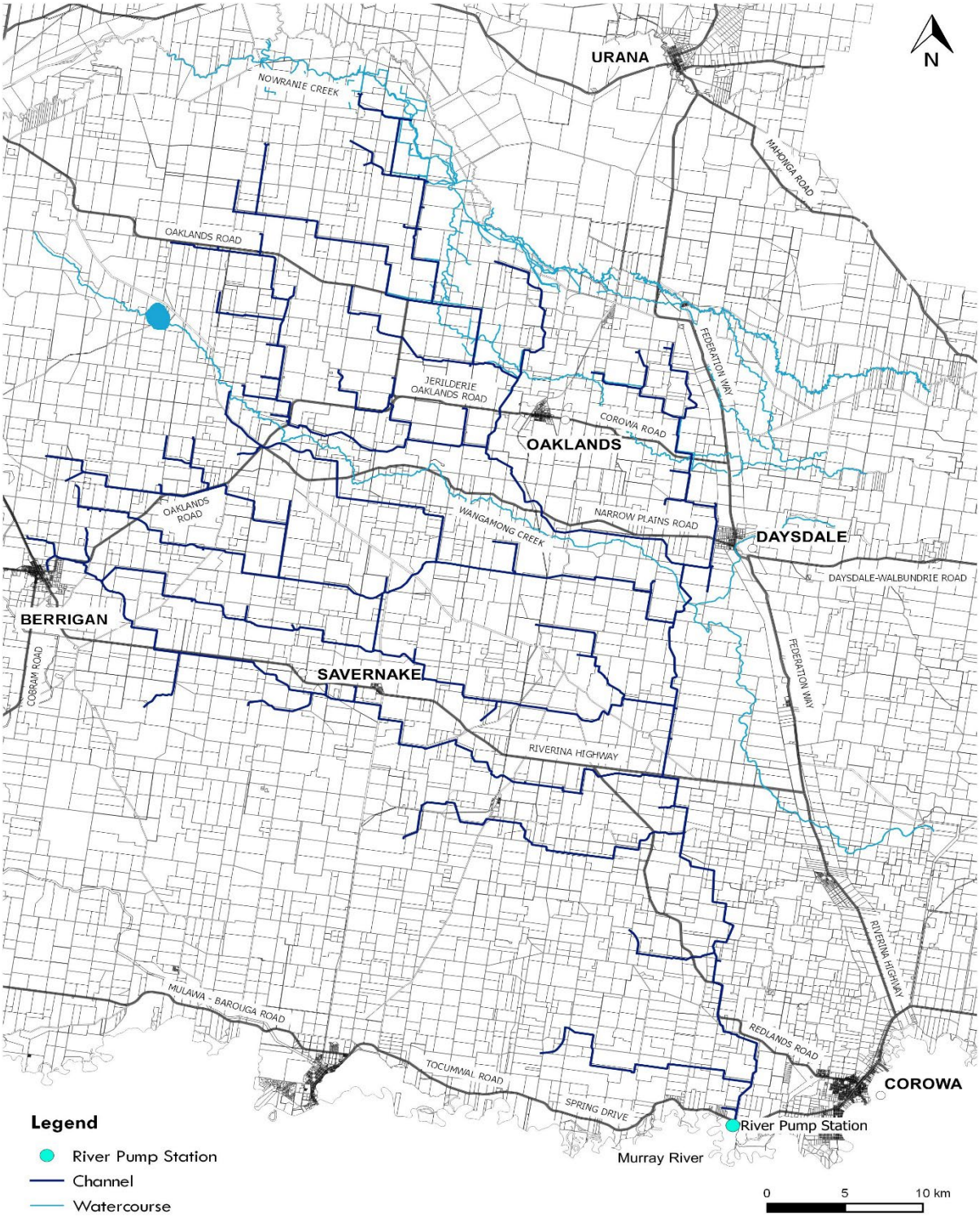
*Figure 1 Location of the WCPID within NSW*




Like the capital costs originally required to build the scheme, WCPID's water distribution operation is funded entirely by its members and managed by the West Corurgan Board of Management, a landholder-elected board that manages the WCPID. The Board of Management holds a portfolio of water entitlement of over 80,000ML across a number of separate Water Access Licences (WALs), delivered to landholders via 565 kilometres of open earthen channel. A maximum daily capacity of approximately 680ML is extracted from the Murray River 9 kilometres downstream of the township of Corowa via 5 electrically driven pumps which lift the water 14 metres vertically, where the pumped water is then delivered via gravity throughout the earthen channel system.

Gross value of agricultural crops produced from the area is over $90,000,000 annually, with that income being derived from sheep and beef production, rice, vegetables, dairy, oilseeds and cereal cropping. The total area irrigated is around 10-20% of the total landmass and is seen to be environmentally sustainable in the long term. The area irrigated varies considerably on an annual basis as a consequence of irrigation water availability and the relative crops and pastures irrigated.

*Figure 2 Schematic of the WCPID Scheme*




The scheme was officially opened on April 12, 1969, and on the 8 September 1976, Statutory Authority was granted to the scheme under the provisions of the Private Irrigation Districts Act of NSW. The Private Act has now been incorporated into the *Water Management Act 2000*.

Operation of WCPID is currently undertaken manually with operating staff taking farm orders, placing water orders, operating pumps, gates and farm outlets, and reading water meters.

# Section 2: Project Description

## 2.1. Project outputs at a glance

500km Piped and pressurised stock and domestic system

Modernise and automate 230 channel regulators

180 compliant water meters installed

Rationalise up to 120 km of open earthen channel

## 2.2. Project Scope

The **WCPID Modernisation project** involves two distinct sub-projects:

- **Sub-project 1:** Construction of a standalone piped stock and domestic water system
- **Sub-project 2:** Modernisation of the existing irrigation delivery network

Whilst separate, the two projects are complementary, and the full range of benefits of one sub-project would not be realised without implementation of the other. Each individual component will generate significant operational, water savings and socio-economic benefits, and collectively are integral to implementation of the proposed overall modernisation project.

The **project** will result in:

- A reduction in water losses from an (annual) estimate of 10-15,000ML/year.
- Water savings of approximately 56-84% of the current estimate – or approximately 8,380ML/year.
- An additional return of approximately 9,420ML of entitlement identified as a reduction in the need for WCPID to use water entitlements as conveyance water following modernisation.
- A total of 17,800ML to be returned to the Commonwealth Environmental Water Holder
- A significant improvement in the operational delivery efficiency of the West Corurgan water supply network.

- A significant improvement in the operating conditions for WCPID staff.
- Significant socio-economic benefits to the WCPID community, including:
    - provision of high-quality stock and domestic water to each member, surrounding villages and other (non-member) landholders
    - improvements in community mental health outcomes
    - improvements to community amenity and safety, including the ability to combat natural disasters such as fire.

### 2.2.1 Sub-project 1 – Construction of a Stock & Domestic system

This sub-project will involve the construction of a separate, stand-alone piped and pressurised stock and domestic (S&D) system. It would not be associated in any way with the irrigation supply infrastructure network operated by WCPID. Nor would there be any 'on-farm' componentry, apart from outlet points and one storage tank. The proposed system will include:

- installation of 1 new pump station on the Murray River (in close proximity to the irrigation pump station).
- construction of a booster pump midway along the system
- primary water filtration and treatment facilities
- approximately 503 km of pipeline and 278 metered outlets and associated storage tanks. The tanks include those required for the pump station and associated water treatment, and one tank at each members outlet point.

Each existing WCPID member will have access to the proposed system. In addition, discussions have been held with landholders outside the current WCPID footprint who may wish to be connected to the proposed system. Several smaller villages are also proposed to be connected (namely Savernake, Rennie and Daysdale). Discussions have also occurred with all three affected councils (Berrigan, Murrumbidgee and Federation Shire) which operate across the WCPID footprint, about potential involvement with the system.

The S&D system will deliver reliable, high-quality water 24/7 to current and future members. It offers benefits to landholders, significant water savings for WCPID, and acts as a catalyst for on-farm investment, providing water supply security and physical and mental health benefits.

Individual members would be required to meet all costs associated with implementing their on-farm infrastructure.

### 2.2.2 Sub-project 2 – Modernisation of the irrigation delivery network

Modernisation of the existing irrigation water delivery network would involve several key components:

- rationalisation and decommissioning of existing infrastructure, including approximately 120 km of open earthen channels, rationalisation of existing dethridge outlets from over 300 to approximately 180 compliant meters, and the upgrading of 190 regulators and nine offtakes
- automation of the remaining water control infrastructure
- modernisation of the O'Dwyer Main channel to allow 'stacking' or storage of irrigation water
- modernisation and automation of the existing pump stations, including the delivery pipe network at the Corowa pump station
- reconfiguration of sections of the existing supply channel network

This sub-project will improve customer service and water delivery efficiency by accurately measuring flows, enhancing system capacity, reducing system losses and operational costs, ensuring reliable water supply, and maximizing infrastructure lifespan.

## 2.3 Project Delivery

### 2.3.1 Resourcing

A well-defined project management governance structure will be established, with clear lines of command and feedback mechanisms to ensure probity, direction and communication are maintained.

A designated project manager will be engaged to oversee a team of design and construction consultants and specialists to deliver detailed designs and technical specifications for the WCPID Modernisation project including hydraulic, civil and geotechnical engineers. This project manager will be appointed by the WCPID Board.

External contractors and suppliers will be engaged via a transparent procurement/engagement process to provide the majority of the necessary works – including material supply and construction. This will ensure probity is maintained at all times through project implementation, and also ensure skilled, suitably qualified and competent suppliers and service providers are engaged to implement the project.

Where possible and practical, local contractors and suppliers will be engaged to deliver the specialist services and infrastructure required to implement the modernisation project.

### 2.3.2 Project Planning

An indicative project plan has been developed which will play an integral role in ensuring any modernisation activities associated with this project.

The project plan is a critical component of the project rollout, providing confidence to the West Corurgan Board of Management, its members, and other stakeholders that the project will be implemented in a timely, cost-effective, and environmentally, socially, and ethically responsible manner. The project will be implemented consistent with any funding deed.

Once appointed, the Project Manager and project management team will develop a detailed Project Management Plan (PMP). This plan will detail the requirements and basis for executing and documenting the modernisation project for WCPID. It will be developed to comply with the funding deed and any other requirements (such as the National Code of Practice for the Construction Industry) and is likely to be developed to a defined project management level such as P90.

The PMP will:

- Establish the project governance arrangements
- Define the project objectives
- Define the management plans
- Provide milestones for performance monitoring
- Identify stakeholders and communication arrangements
- Comply with relevant requirements of the funding deed, and

- Demonstrate to the project partners the project can be implemented on time and within budget.

As part of the PMP, individual management plans will be developed to ensure successful project delivery. These plans will cover probity, risk management, Work Health and Safety (WHS), design and construction management, procurement, stakeholder engagement, change management, project quality, and commissioning.

The PMP will also:

- Describe the approach the modernisation sub-committee and project team will take in implementing the project, to ensure compliance with WCPID policies and procedures, and other relevant State and Commonwealth level requirements
- Be authorised and endorsed by the WCPID modernisation sub-committee
- Be distributed to all consultants, contractors and members for action and information purposes, and
- Be updated whenever there are significant changes to project information.

A well-defined organisational structure will be established, with clear lines of command and feedback mechanisms to ensure probity, direction and communication are maintained.

A clear process will be established where a team of individual consultants and contractors will be engaged to implement specific aspects of the modernisation project. These consultants and contractors will be engaged through, and work on, a series of detailed 'tender briefs' which will be developed by the Project Manager, within which a 'scope of works' will be developed for each component of the project. Further detail on the proposed procurement process can be found in section 2.3.5 below.

## 2.3.4 Designs

In September 2022, the WCPID was awarded $1,353,000 to undertake a detailed feasibility study, to best understand the range of options to modernise the WPCID, likely water savings that could be generated and potential capital cost associated with the project. The feasibility study included preliminary investigations including soils analysis, geotechnical investigations, flow accumulation analysis, electrical infrastructure analysis, channel automation investigations, condition assessment of existing infrastructure and options analysis report and rationalisation options for both the O'Dwyer main and laterals. These technical reports informed the development of an overall design report and preliminary drawings for the modernisation of existing infrastructure (sub-project 2) while a desktop study was undertaken for the proposed S&D system (sub-project 1) as a component of the feasibility project.

### 2.3.4.1 Modernisation of the irrigation delivery network

As a component of the feasibility study, Premise Australia Pty Ltd undertook a detailed hydraulic review of the existing irrigation supply network**.** Following on from this review, Premise undertook detailed design work to determine earthwork requirements to meet system design flow requirements**.**

The review information was provided to Rubicon Australia to allow them to develop specific designs for individual regulating structures within the modernised irrigation network. Rubicon then used this information, coupled with their industry-based costings to develop specific costs for each individual structure (including associated costings for commissioning, automation and WHS compliance). In addition, costings were developed for individual metering solutions at each Member offtake point.

Rubicon also provided costs for communication hardware and software, licensing agreements and ancillary items.

The work that has been completed on the designs for the irrigation network could be considered as 'construction ready'. There will need to be some final design work completed – however, the vast majority of all design work has been completed as part of the feasibility study.

#### 2.3.4.2 Construction of a Stock & Domestic System S&D

Pinion Advisory were engaged to develop a 'fit-for-purpose' pressurised pipeline Stock and Domestic (S & D) system as part of the feasibility study.

In consultation with the feasibility study project team, Pinion analysed several potential pipeline routes, before settling on a preferred route. This preferred route was identified to minimise the pipeline length, maximise Member (and potential non-member) access, optimise metering point access to electricity, have no impact on any identified archaeological or heritage sites, and to minimise impacts on road reserves, to the point where underground drilling across road reserves was included in the costings.

The final recommended route includes specific detail around pipeline sizing, associated infrastructure requirements such as valves and meters, a water treatment plant, and main and booster pump stations. Pinion have used their extensive industry experience in the design of such systems, and industry specific infrastructure costs to prepare the detailed costings for this project.

Whilst final designs would need to be completed prior to construction, the proposed S&D system is greatly advanced on what could be considered a 'concept' design. Because of the highly advanced state of the design work completed, it is envisaged that to move from the current design status to 'final design' would be a relatively short and seamless process.

### 2.3.5 Procurement

WCPID does not have a formal procurement policy as such – rather it has a governance structure which outlines delegation levels for certain actions and levels of expenditure. The West Corurgan Board of Management will be ultimately responsible for managing the modernisation project.

The appointed Project Manager, in consultation with WCPID, will prepare formal tender briefs for each project component. These briefs will be distributed publicly or through an invited tender process.

A clear process of assessment and approval of tenders has been developed to ensure a high degree of probity is maintained at all times. This process will keep WCPID fully informed about the consultants and contractors engaged, their services, costs, responsibilities, and WH&S compliance. Detailed information on the tender process is in the PMP.

Consultants and contractors will work on detailed tender briefs developed by the Project Manager, outlining the scope of works for each project component. These briefs will be used to obtain submissions from third-party tenderers, detailing project requirements, compliance with legislation, and the competencies and costs of tenderers.

A combination of open and invited tenders will be used to expedite the selection process while maintaining probity. This approach will reduce the time needed to find successful tenderers for various project components.

Invited tenders will be chosen based on the collective experience and industry knowledge of the Project Manager and team. This ensures that experienced consultants and tenderers are approached. The selection will also consider experts who have successfully delivered similar projects. The Project Manager will recommend these tenderers to the West Corurgan Board of Management for approval. Upon review, the Project Manager will engage the services of the selected tenderers on behalf of WCPID.

## 2.5 Licencing and Approvals

A significant component of the proposed modernisation of the WCPID will involve the construction of new, and/or upgrading of, existing water supply and water reticulation infrastructure.

Where works, for example the installation of upgraded irrigation infrastructure, are to occur within the existing supply channel alignment, based on the provision of the *Water Management Act 2000*, there is likely to be no requirement to obtain additional approvals or licences. Where there is the construction of new infrastructure (such as may be the case for a new stock and domestic scheme), there may be the need to obtain new and/or additional approvals.

As part of the detailed investigations undertaken as part of the feasibility study into this project, the range of licences, approvals and regulations that may need to be addressed were investigated. This included determinations that may be required under both NSW Government and Commonwealth legislation.

The types of approvals that may be required were considered during the development of the feasibility study. It has been identified that further consultation will be required with the following approval authorities to determine the likelihood and/or extent of licences or approvals required:

| Responsible agency | Approval/permit/licence | Reference |
|---|---|---|
| Murrumbidgee Shire Council, Berrigan Shire Council, Federation Shire Council, NSW Western Planning Panel | Development consent | Part 4 of *the Environmental Planning & Assessment Act 1979*<br>*SEPP (Transport and Infrastructure) 2021* |
| Murrumbidgee Shire Council, Berrigan Shire Council, Federation Shire Council, NSW Western Planning Panel | Works within a road reserve | Section 138 of the *Roads Act 1993* |
| Murrumbidgee Shire Council, Berrigan Shire Council, Federation Shire Council, NSW Western Planning Panel | Biodiversity Development Assessment Report | *Biodiversity Conservation Act 2016*<br>*Local Land Services Act 2013* |
| WaterNSW | Water supply works approval (TBC) | Section 90 of the *Water Management Act 2000* |
| NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) | Controlled Activity Approval (TBC) | *Water Management Act* (2000) |

| Responsible agency | Approval/permit/licence | Reference |
|---|---|---|
| NSW National Parks and Wildlife Service (NPWS) | Licence, alteration to existing conditions | *NPWS Act 1974 No. 80* |

The proponents have already completed a significant amount of consultation with Local Government Authorities in terms of understanding the necessary regulatory requirements. In addition, the proponents have undertaken preliminary discussions with the NSW Western Planning Panel, which would likely have a significant role in approving the S&D system.

A specific requirement for statutory approvals will be required from NPWS in relation to the site of the proposed S&D pump station. The pump and discharge pipe will lie within the NPWS Estate, and would require amendments, easements and/or approvals to allow the construction of the pump station to commence. These discussions have occurred with NPWS, and a pathway to allow this work to take place has been identified. NPWS have provided evidence of the consultations undertaken to date.

WCPID have also identified some contingencies should this process not be successful or timely, and these are described further in the attached risk register, but include options to relocate to the site of the existing irrigation pump station, and/or to relocate on private land immediately upstream of the preferred pump site.

Given the extensive background work that has occurred in identifying the required licences and approvals, the consultation with agencies and authorities that has occurred to date as part of the feasibility study, and the good relationships WCPID and its consultants have developed with these agencies and authorities, there is a high degree of confidence the regulatory component of the project can be managed effectively and in a timely manner.

# Section 3: Socio-Economic Criteria

## 3.1. Preparing for the future

Implementation of this project will support agricultural production, regional economies, and the environment by forming a fully integrated water supply network. The improved water delivery efficiency and increased delivery performance this project will deliver will enable WCPID to meet industry demands and enable regional agribusinesses to maximise their potential for sustainable production.

This project will deliver improved customer service and the efficiency of the water delivery network through:

- Accurately measure flows throughout the system, including water delivery to individual farm outlets,
- Improving system flow capacity, flexibility and responsiveness, providing additional opportunity to meet customer demand, improve on-farm irrigation efficiency,
- Reducing water losses from the system,
- Reducing operational costs,
- Providing a safer workplace,
- Providing high quality, reliable stock and domestic water supplies to individual landholders,
- Undertaking system rationalisation to improve operational efficiencies, and
- Delivering cost-effective investment that maximises the lifespan of existing civil infrastructure wherever possible.

A direct result of increased water use efficiency for irrigators is productivity gains and a cleaner and greener operation as growers are able to better target water use to the requirements of the plants, and to respond to climatic conditions. It has been shown that previous automation projects have already led to improved quantity and quality of crop yield per unit of input and improved flexibility of farm systems enabling greater frequency and reliability of crop yield. This in turn supports regional and national goals, such as the Commonwealth goal for agriculture to be a $100 billion industry by 2030.

This project will assist WCPID in delivering the Basin Plan's key goal of balancing environmental objectives with supporting farming and other industries, benefiting the Australian community and preparing local communities to thrive in a water-constrained future.

## 3.2. Investing in current and future viability

Modernising the WCPID will create an environment that attracts higher-value industries to the area by providing increased ability to supply irrigation water on demand, delivering stock and domestic water during times of low water availability, and offering high-level security in terms of water deliverability.

These improvements are crucial for producing high-value commodities and industries. The WCPID's strategic advantages, such as a climate conducive to diverse crop production, highly productive soils, a progressive member-elected Board, and a strategic location above the Barmah choke on the Murray River near the Hume Dam, make it an attractive area for developing food, fibre, and processing industries and facilities. These factors collectively enhance the region's potential to attract agricultural investments and ensure sustainable growth.

This project will provide a catalyst to drive significant joint-venture and co-investment business arrangements, fostering further investment within its footprint and the broader local region. By balancing environmental and economic objectives, the project supports farming and other industries while preparing local communities to thrive in a water-constrained future. It will enhance the financial viability of the irrigation district by improving water supply efficiency and reliability, focusing on modernising infrastructure that will be actively used in the future, and aligning with the strategies and plans of relevant irrigation businesses. This cohesive approach ensures that investments are made in areas with long-term utility and relevance, supporting broader regional goals and sustainable development.

## 3.3. Benefits to industry

### 3.3.1 Building a sustainable irrigation future

This project aligns with the objectives of the Murray Darling Basin Plan by promoting water conservation, equitable water allocation, environmental protection, climate change adaptation, and regional development. It exemplifies the basin plan's integrated and balanced approach to managing water resources for the benefit of all stakeholders and the long-term sustainability of the basin's ecosystems and communities through:

**Water Conservation**: The project focuses on optimising water use in rural communities and agricultural operations. By reducing water losses and improving water management practices, the project contributes to overall water conservation. The project will return 17,800ML of water to the environment. This aligns with the basin plan's objective of ensuring a sustainable water supply for all stakeholders, including the environment.

**Enhanced Water Allocation:** The project will ensure more accurate measurement and allocation of water resources. This ensures that each stakeholder receives a fair and equitable share of the available water, promoting transparency and reducing conflicts over water allocation. Proper water allocation is a key component of the basin plan's goal to balance the needs of various users.

**Improved Environmental Outcomes:** The Murray Darling Basin Plan places significant emphasis on restoring and maintaining the health of the basin's ecosystems and water-dependent environments. By optimising water use through efficiency measures, more water can be dedicated to environmental flows, helping to protect and rejuvenate wetlands, rivers, and habitats critical for native flora and fauna.

**Climate Change Adaptation:** As climate change impacts water availability and exacerbates drought conditions in the basin, investing in water efficiency infrastructure becomes crucial for adapting to these challenges. The project's implementation enhances resilience to climate variability, which is a fundamental aspect of the basin plan's long-term vision for sustainable water management.

**Regional Economic Development:** A well-executed water efficiency project can lead to increased agricultural productivity, economic growth and diversification in rural communities. By supporting primary producers and other water users in maximising water use efficiency, this project will lead to a more sustainable, resilient and vibrant regional community and economy.

### 3.3.2 Secure Supply for Industry

Currently, there are no processing industries located within the footprint of the WCPID.

However, with the provision of the '24/7' S&D system, and the commensurate security of water supply this provides, there will be significant opportunities for agricultural production to be underpinned by this investment.

In addition, the improvements in delivery efficiency that will be realised by modernisation of the irrigation infrastructure, coupled with the ability to 'stack' and hold water within the O'Dwyer Main channel, provides producers and industry with greater confidence to invest in projects which require greater reliability and security of water supply.

In addition, as part of the feasibility study, the proponents undertook consultation with some industry groups which do not currently have a presence in the local area but may wish to avail themselves of the significant opportunities WCPID offers. The investment in water infrastructure would certainly act as a stimulus for further expansion of higher value agricultural enterprises and may well provide the opportunity for 'value-add' industry to invest in the WCPID area.

## 3.4. Benefits to community, region or state

Throughout the implementation of the project it is anticipated that WCPID would engage and retain the services of locally and regionally based goods and service providers wherever practical, and where these will provide the best value for money. West Corurgan recognises and values the ongoing benefits of local investment, where the direct procurement of goods and services leads to ongoing benefits within the community and local businesses.

In addition to the local and regional direct and indirect stimulus this would provide, the benefits to the local and broader community of implementing the project includes:

- Improved water use efficiency
- Improved water delivery volumes and reliability
- Improved responsiveness to water demand
- Return of 'recovered' water for environmental purposes
- Enhanced agricultural production – both in total and in reliability
- Impetus for greater production diversity and value-adding
- Reductions in WH&S related issues for network operators
- Reductions in water logging and water table accessions as a result of minimising leakage

- Reduced likelihood of 'catastrophic failure' of existing infrastructure, and the consequences to downstream users, the immediate environment and the economic security of WCPID community
- Improved prosperity and confidence to invest (and attract such investment) locally

Evidence from implementation of other projects of a similar nature, suggest strong economic and community stimulus results from modernisation projects.

For example, Narromine Irrigation Board of Management (NIBM, 2017) demonstrated a range of benefits to its members from implementation of its modernisation project. Many of these benefits relate to agricultural production enhancements over the long term, more 'guaranteed' production, and a willingness to continue investing in their businesses – all of which contribute to sustainable and vibrant regional communities.

In addition, implementation of the NIBM modernisation project was assessed against a range of key performance indicators, as described in Table 3.1 below.

*Table 3.1 Summary of key outcomes from the NIBM modernisation project*

| Key performance indicator | Outcome |
|---|---|
| Program delivers the contracted share of the water savings in the form of water entitlements transferred to the Australian Government | The Narromine Irrigation Scheme Modernisation Project delivered water savings in the form of water entitlements to the Australian Government. |
| Reductions in water losses to farm gate and improvements in network water use efficiency, water management and monitoring | The Narromine Irrigation Scheme Modernisation Project has significantly improved water delivery efficiency from a long-term average of 69 to 92 per cent. |
| Reductions in on-farm water losses and improvement in on-farm water efficiency and water management | 42 on-farm efficiency projects were undertaken as part of Narromine's involvement in the Irrigated Farm Modernisation programme administered by the NSW Department of Primary Industries. This achieved on-farm water savings, with savings returned to the Australian Government as water entitlements. |
| Increases in the volume of available water from water savings and improved flexibility and control of water for irrigated crop production, livestock consumption and domestic consumption for customers/members of private irrigator infrastructure operators | The Narromine Irrigation Scheme Modernisation Project has increased the volume of available water for its remaining members via improved water delivery efficiency, on-farm efficiency projects, improved network management and rationalisation. |
| Reduction in the risks of water availability that result in water being available more frequently or in larger volumes for irrigation production that leads to additional opportunities for economic revenue for customers/members of private irrigation infrastructure operators, which assists in securing a sustainable future for associated irrigation communities. | The Narromine Irrigation Scheme Modernisation Project has reduced the risks associated with water availability, created opportunities for additional crop production and economic revenue, thereby improving the profitability and sustainability of its members and assisting with securing a sustainable future for associated irrigation communities. |

**Source:** NIBM, 2017 (*modified*).

Modelling undertaken by the then Federal Department of Agriculture and Water Resources (NIBM, 2017) showed irrigators were likely to be able to grow more crops on average with a modernised and rationalised irrigation scheme. Rationalised farms were likely to benefit from reduced debt, reduced costs on their businesses, and a stock and domestic system provided significant household and dryland farming benefits.

This modelling also showed a significantly improved outcomes for the Narromine members' financial outcomes, with the infrastructure investment allowing for higher business returns to be achieved. Modelling showed that modernisation enables new levels of profitability, crop diversification and financial stability to be achieved. Without the project many farms may have encountered viability issues over the longer term. Overall, modernisation should assist the Narromine irrigation community to be sustainable in the context of reduced water availability (NIBM, 2017).

Anecdotally, NIBM has seen a net importation of irrigation water – primarily from water entitlements held directly on the river system. This net importation further enhances the efficiency of water delivery across its footprint and is a strong endorsement of the success of the NIBM modernisation project. This has also been replicated in other modernised areas, such as Trangie Nevertire Co-operative Limited.

It would be expected similar results would be generated to the West Corurgan community through modernisation.

Small and medium, regionally based Australian enterprises will be strongly encouraged to submit proposals for individual components of the proposed project. This will help ensure investment is made in regional Australia, and that taxes are paid by Australian based providers to the benefit of the entire Australian economy and community. Indeed, WCPID would be strongly encouraging the engagement of so-called 'mum and dad' small businesses to complete components of this project, provided costs and work quality standards compare favourably to larger national businesses.

The greatest benefit to the Australian economy will be provided where the 'best value for money' principle is used when assessing individual service providers.

## 3.5. Environmental benefits

This project will provide a range of environmental benefits, including:

- The return of 17,800ML of water entitlements to the environment
- Reduced accessions to the water table through a rationalisation of the channel network
- Reduced waterlogging at the farm level – where (complementary) investment in infrastructure will improve on-farm efficiency
- The option to bypass or transfer water between the Murray and Murrumbidgee systems for environmental watering purposes
- Water points that would be established on-farm via the S&D system provided refuges for native animals and birds in times of drought
- The ability to provide water to on-farm wetlands
- Manage water flows within the system by 'storing' excess flows within the O'Dwyer Main, minimising unplanned or untimely end of system outflows which may adversely impact on the downstream environment (through flooding, increased waterlogging etc).

In addition, a modernised WCPID may be viewed as a desirable alternate location to attract irrigation water from below the Barmah Choke, upstream. The productive soils and favourable climate are conducive to a range of higher value enterprises, and if this were to occur, there would likely be a commensurate reduction in water losses associated with conveying water downstream in the Murray River – such as seepage and evaporation – making more water available to the consumptive pool and to the environment.

## 3.6. Supporting the Murray Darling Basin Plan

The project supports the healthy working basin objectives of the Murray-Darling Basin Plan and the aligns with the Murray Water Resource Plan. The investment in water dependent regional communities also mitigates some of the impacts of reduced water availability resulting from the Basin Plan.

## 3.7. Cultural impacts and benefits

A detailed desktop study was commissioned as part of the feasibility study to determine the extent of potential impacts on cultural and European heritage.

The study identified there would be no significant impacts to Aboriginal or European heritage items or places as a result of project implementation.

- There are two heritage constraints for the WCPID modernisation project one related to Aboriginal Heritage and one related to European Heritage.
- The desktop assessment has identified Aboriginal objects, and areas of archaeological sensitivity, within the study area.
- One previously recorded Aboriginal site is located within the study area, but not directly related to the proposed modernisation. If this were to change, a site inspection would be undertaken with a representative of both the Albury and District and Yorta Yorta LALC's.
- If this site cannot be avoided an AHIP will be required before construction commences.
- If suspected Aboriginal objects are located during future works, works would cease, and an Aboriginal heritage consultant advised to assess the find and recommend if further investigation or permits are required.
- No Native Title claims, determinations or registrations are located within the study area.
- The proposed activity is located within a disturbed context.
- One State Heritage Listed item has been identified within 100m of the proposed stock and domestic route, but will not be impacted by the development.
- No other European Heritage constraints have been identified through desktop assessment.

During the project inception and construction phases, the local indigenous community will be engaged to explore opportunities for further engagement and involvement with the project. Where possible, practical and feasible, WCPID will procure products and services in line with the Indigenous Procurement Policy – which aims to stimulate Indigenous entrepreneurship, business and economic development and providing Indigenous Australians with more opportunities to participate in the economy.

## 3.8. Community support and engagement

The success of the Murray Darling Basin Plan relies on collaboration among various stakeholders, including water users, communities, environmental groups, and government agencies. The implementation of this project involves engaging and collaborating with these stakeholders, promoting a cooperative approach to water management, and advancing the broader goals of the basin plan. Overwhelming support for this project has been provided by WCPID members, and a significant amount of stakeholder engagement has been undertaken with a range of Government (local and State) agencies.

An important component of undertaking the various tasks and activities being investigated as part of the feasibility study included the aspect of consulting with the local community.

The WCPID members were regularly (monthly) informed of the progress of the feasibility study through the WCPID monthly publication – "*Corurgan Comment*". This publication is distributed to each member. A project update was provided each month for the duration of the feasibility project.

WCPID members were also directly consulted via means of a member survey about their thoughts on a stand-alone Stock and Domestic Scheme. The survey included some general information about what such a scheme might look like, and some of the possible governance arrangements. It also requested members to identify their likely water requirements for individual farms/properties.

Approximately 30% of individual members responded directly to this survey – a reasonable representation of the WCPID membership.

Two community/Member meetings were conducted in October 2023 at Savernake and Oaklands. These meetings were well attended, with over 50 WCPID members in attendance – representing a significant proportion of the member base. A full overview of the project was provided at these presentations, with copies of all documentations provided at these meetings also sent to each WCPID Member.

The overwhelming feedback from these meetings was extremely positive toward the feasibility study, and to moving forward with a potential modernisation program. This feedback was provided directly to the Project Management team and the WCPID Board and management, through various informal mechanisms. In addition, a 'show of hands' was requested at each of these meetings by the WCPID Board chairman seeking endorsement of the findings of the feasibility study, and to explore opportunities for implementing a modernisation project. At both meetings, this was unanimously supported.

There was strong recognition the Scheme had served members extremely well in the 50 years since its inception – but there was recognition that to remain competitive and viable for the next 50 years, major investment in modernisation was required.

In addition, each WCPID Member located along the O'Dwyer Main was directly engaged to determine potential infrastructure rationalisation options, including direct reductions in farm outlets and potential alternative farming/irrigation activities if modernisation were to proceed.

Whilst there was no need to directly consult with non WCPID members, the WCPID Board and the Project Team identified potential opportunities to include and connect non WCPID members to the potential S&D scheme.

Those not connected directly to a river or the West Corurgan supply network are reliant on storage of runoff into ground tanks and/or groundwater to supply their stock and domestic water needs. Connection to the WCPID S&D scheme would afford such landholders the opportunity to secure a more reliable, better quality water supply year-round.

Over 300 Expression of Interest letters were mailed to landholders directly surrounding the WCPID. Approximately 30 landholders returned forms to the Project Team. These landholders and their properties have been included in the proposed S&D scheme concept design. In addition, there is likely to be further opportunities to allow additional landholders to connect if the project were to proceed. However, it would be dependent on design constraints, development of appropriate cost-sharing arrangements, and appropriate membership arrangements. This has been taken into account (within the bounds of certain parameters) in the design of the proposed scheme but would require further refinement to ensure the provision of appropriate levels of service.

In addition, provision has been made in the S&D pipeline to include several small villages in the area – Savernake, Rennie and Daysdale. These villages have been reliant on WCPID filling ground tanks from their supply channel network in order to fulfil their domestic (non-potable) water supply needs.

The village of Daysdale is by far the largest village – with approximately 30 residents. The project team met directly with the Manager of the Daysdale Water Supply scheme in January 2023 and outlined the possibility of a direct connection to the proposed S&D scheme. These initial discussions were extremely positive and (have and) will continue if and when the project is implemented.

Finally, implementation of (components) of this project will be complex, and likely involve multiple agencies involvement and approval.

The Project team have undertaken an extensive amount of consultation with a range of stakeholders, including the provision of information, information requests, email correspondence, face-to-face discussions, on-site meetings and provision of written materials, such as briefing notes and project background papers.

**Table 3.2** provides an overview of the extent of consultation with agencies and organisations.

The NSW Rural Fire Service have indicated that the provision of standpipes as a component of the stock and domestic scheme would have significant benefits to fire-fighting capacity.

Others, such as the Daysdale Water Users group have provided informal advice that they would be extremely willing to be connected to this project.

Consultation has been undertaken with the private sector to understand any propensity to invest or be involved in components of project implementation. There is interest from the private sector, and it will be incumbent on WCPID to follow up on these opportunities.

*Table 3.2 Project consultation undertaken to date*

| Agency/organisation | Nature of interaction | Issues covered |
|---|---|---|
| Berrigan Shire Council | Provision of briefing note, face to face meetings, email correspondence, direct discussions, | Potential approvals required and processes, likely impacts, interest in connection to S&D scheme, project background |
| Murrumbidgee Shire Council | Provision of briefing note, face to face meetings, email correspondence, presentation to Council meeting, direct discussions | Potential approvals required and processes, likely impacts, interest in connection to S&D scheme, project background |
| Federation Shire Council | Provision of briefing note, email correspondence, direct discussions, | Potential approvals required and processes, likely impacts, interest in connection to S&D scheme, project background |
| Murray Local Land Services | Provision of briefing note, face to face meetings, email correspondence, direct discussions, | Potential approvals required and processes, likely impacts, interest in connection to S&D scheme, project background |

| Agency/organisation | Nature of interaction | Issues covered |
|---|---|---|
| NSW Rural Fire Service | Provision of briefing note, face to face meetings, email correspondence, direct discussions, | Potential approvals required and processes, likely impacts, interest in connection to S&D scheme, project background |
| National Parks and Wildlife Service | Provision of briefing note, face to face meetings, email correspondence, direct discussions, on site meetings | Potential approvals required and processes, likely impacts, interest in connection to S&D scheme, project background |
| NSW Forestry Corporation | Provision of briefing note, face to face meetings, email correspondence, direct discussions, | Potential approvals required and processes, likely impacts, interest in connection to S&D scheme, project background |
| Daysdale Water Users Group | Provision of briefing note, face to face meetings, email correspondence, direct discussions, on site meetings | Interest in connection to S&D scheme, project background |
| NSW Department of Primary Industries | Provision of briefing note, face to face meetings, email correspondence, direct discussions, | Potential approvals required and processes, likely impacts, project background |
| NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) | Provision of briefing note, face to face meetings, email correspondence, direct discussions, | PID licensing and approvals issues |
| Water NSW | Provision of briefing note, face to face meetings, email correspondence, direct discussions, | PID licensing and approvals issues |
| Almond Board of Australia | Provision of briefing note, email correspondence, direct discussions, | Interest in connection to/investment in S&D scheme/piped irrigation proposal, project background |
| Kagome Australia | Provision of briefing note, email correspondence, direct discussions, | Interest in connection to/investment in S&D scheme/piped irrigation proposal, project background |
| Essential Energy | Provision of background material, email correspondence, direct discussions, on-site meetings | Potential approvals required and processes around infrastructure upgrades, project background |
| Kidder Williams Pty Ltd | Provision of briefing note, email correspondence, direct discussions, | Potential for investment in piped irrigation proposal |

WCPID has sought support for the project from a range of stakeholders, including individual members, industry groups and local Government. Letters of support for the project have been provided as evidence of this support and further demonstrates the broad range of support this project has within the local community and broader region more generally.

## 3.9. Positive Economic Outcomes

A detailed cost benefit analysis was conducted under guidelines provided by NSW Treasury.

### 3.9.1. Management of future lifecycle costs

Managing the future costs of WCPID's asset base is an important component of assessing the overall benefits of a project of this scale. The WCPID Board undertakes strategic forward capital planning to ensure there are adequate funds in reserve to complete asset replacement and upgrades, and this process will continue to be implemented as a result of this project.

The full capital costs for the project are anticipated to be sourced from the Australian Government in exchange for water entitlements.

WCPID is experienced in not only the assessment of future replacement needs of its infrastructure, but also the ongoing operational and maintenance costs. The assets WCPID currently manage are assessed through detailed asset management plans and associated maintenance and inspection schedules.

WCPID currently budgets for asset replacement and ongoing operation and maintenance costs involved with the operation of its irrigation delivery network. This is done through the raising of fees and charges directly on the users of the network. This situation will continue for the proposed works.

In replacing the existing (ageing) irrigation infrastructure, it is likely that short- and medium-term costs associated with its operation and maintenance will actually fall. It is expected similar asset renewal charges to those applied currently would continue to be set aside by WCPID.

Overall, it is expected there would likely be minimal net change to the costs placed on network users for ongoing operational, maintenance and asset renewal that WCPID currently implements because of this project specifically for the irrigation modernisation component of the project.

However, WCPID acknowledges there will be additional charges needed to be raised to operate, maintain and plan for future asset replacement with implementation of the proposed S&D network. As a component of the feasibility study, a breakdown of anticipated additional ongoing costs for this component of the project were detailed. The WCPID Board is fully informed of these additional costs.

The project will generate water savings to WCPID, and consequently there will be less water required for WCPID to meets its conveyance water requirements to operate its system. This has a direct economic benefit to WCPID, and allows a greater proportion of the water required to operate the system to actually be delivered on-farm. This has a significant economic benefit to WCPID itself, and to the users of the delivery network more generally. It also means that more water becomes available to meet environmental requirements and allows progress to be made by the Commonwealth to fulfil its water recovery targets.

### 3.9.2. No impacts to the water market

Total (average annual) water savings of approximately 8,400ML will be generated as a result of this project. These savings will be derived by reducing conveyance and seepage losses, improved operational efficiencies and accurate metering. There will be no reduction in the amount of water available for consumptive use.

Upon completion, the project will see a significant decrease in the volume of water required to meet these conveyance losses and will allow a greater proportion of allocation water to be delivered to WCPID members. A further 9,400ML of entitlements will no longer be required to operate the system. In total, some 17,800ML

are proposed to be returned to the environment. These measures will ensure there are no negative impacts on current water availability and markets.

The West Corurgan PID holds a number of separate Water Access Licenses (WALs). It holds a works approval through Water NSW to extract water from the Murray River at its pump station site, approximately 9 km west of the township of Corowa.

This project proposes to transfer Murray River Regulated River General Security (13,800ML) and Murray River Supplementary Water (4,000ML) entitlements to the CEWH. WCPID has sufficient entitlements available to enable the transfer of the proposed entitlements.

WCPID is able to unequivocally demonstrate the water entitlements have been held for at least three years.

### 3.9.3. Supporting Regional Communities Economically

Better security of water supply for irrigated production and downstream processing also underpins greater domestic food security. As seen in 2020, low water allocations combined with strong consumer demand as a result of the pandemic, led to a perfect storm of low rice supplies and excess demand for a staple product. Many crops, such as rice, require water security in order for growers to invest in planting and this project will help to offer such security.

Irrigation in the Murray Darling Basin already makes a very considerable contribution, supporting 9,200 irrigated agriculture businesses producing $22 billion worth of food and fibre annually. The WCPID makes a small but meaningful contribution to this activity and has the potential to increase it through increased water efficiency and increased crop yields per ML of water applied. Greater confidence in the delivery of water as and when it is required to meet crop demands will underpin additional agricultural development which leads to increased economic activity and income in the region, better supporting regional communities.

Enhanced agricultural activity will also support downstream processing such as food manufacturing, product milling, animal feed production, etc. This is particularly important in the context of the Basin Plan where improved regional outcomes can mitigate some of the negative impacts of the Plan on irrigation reliant communities. The employment delivered through value adding, downstream processing and food and water related tourism are very important in building resilience through a diverse economic base. This diversity becomes even more evident in periods of drought.

Investments that result in increases in farm value added without altering intermediate inputs generate productivity improvements and result in net economic gains for the local economy. For example, as demonstrated by a 4% p.a. ($22M) increase to Murrumbidgee Irrigation Area GDP and 75 extra jobs annually as a result of the modernisation of its delivery network (Murrumbidgee Irrigation, 2021).

A large proportion of these gains have been achieved by improved quality and quantity of crop yield per unit input resulting from greater access to higher flowrates and precise irrigation methods. It has been shown that under average climate conditions (based on the 2000-01 to 2017-18 period), there has been a marginal decrease in the application rate and an increase in the yield for rice and cotton in the Southern Connected Basin[1].

[1] *Hughes, N, Gupta, M, Soh, W, Boult, C, Lawson, K, Lu, M, Westwood, T, The Agricultural Data Integration Project. ABARES research report, Canberra, 2020*

Similar scale improvements would be achievable from modernisation of the WCPID. In addition, it is highly likely that improvements could be higher, given that WCPID would be well positioned to learn from any lessons that modernisation has bought to other irrigation areas.

It is also considered likely that improvements in water deliverability and reliability would lead to higher value agricultural investment within WCPID. Coupled with its favourable climate, soil resources, location within the irrigation delivery network (ie. closeness to water sources – and lower river delivery losses) and to major transport routes, modernisation of the supply network could be a significant catalyst to more diversified, high value production. Such diversification would be an important factor in underpinning the long-term viability of the district.

This project will support ongoing efforts of farmers to make every drop count and increase water productivity. The Project will leverage this investment to provide a further substantial increase to farm productivity by:

- Ensure automation across the delivery network allowing all irrigators to benefit from the investment;
- Reducing ordering times to ensure that crops receive watering precisely when required; and
- Decreasing shut off notification by managing excess water within the existing irrigation network (in particular 'stacking' water within the O'Dwyer Main) resulting in a reduction in crop water logging and significant increases in yield, and minimal in system water losses.

The project will create value for WCPID members through:

- Significantly increasing customer service levels and system capacity through precise water control/delivery throughout the supply network;
- Improved river operations efficiency, internal irrigation network efficiency and on farm irrigation efficiency;
- Linking to on-farm efficiencies for higher overall irrigation efficiency from river to paddock;
- Providing accurate metering to ensure fair accounting of water extractions from the network;
- Increasing regional productivity through water use efficiency and supporting further agriculture development;
- Enhancing delivery efficiency through an automated network; and
- Increase grower confidence through meeting customer demand.

Increasingly, agribusinesses are realising the substantial benefits of on-demand water availability that provides moisture to crops precisely when its required. On-demand water is extremely difficult to support due to conveyance timeframes and WCPID is required to forecast usage in advance of receiving final orders. Any sudden spikes in customer demand often cause restrictions within WCPID's customer base due to insufficient water available from the river to meet this demand, resulting in lost yield, poor water efficiency on farm and a reduction in grower confidence. A benefit of an automated system is that spikes in demand can be met with minimal delay with water held in the system.

Equally important to on-farm water efficiency and yield maximisation is the ability to cease irrigating precisely when the soil has optimum moisture content. To achieve this, customers require the capacity to shut down irrigation instantaneously. This becomes problematic and difficult to manage off-farm, particularly at high flows. The automated system will allow water managers to provide a "buffer" for rejected flows that would

otherwise spill within the delivery network, and a fully automated and integrated network allows the control to ensure that this level of service is achievable.

### 3.9.4. No negative third-party impacts

The proponent of the project is the operator of the existing network, and the proposed manager of the new infrastructure to be established under the project.

Should the project proceed into implementation, a detailed consultation plan will be developed and implemented, and extensive (additional) consultation undertaken. This will ensure 'no person or organisation is left behind' in terms of their potential involvement in this project, and/or to ensure they are not (inadvertently) adversely impacted.

It is not envisaged there will be any unforeseen negative third-party impacts as a result of this project.

It is expected to be no job losses incurred by WCPID as a result of this project. Rather it is anticipated that existing jobs traditionally associated with the manual operation of an irrigation network will transition into more highly skilled, network operation positions which are also likely to be higher paid.

Changing the way WCPID Members obtain water to meet their stock and domestic needs will require changes in operation and management at the individual farm level. It will also require the investment of additional capital. However, the long-term benefits of having access to higher quality, more reliable piped water, such as improvements in physical and mental health, likely improvements in livestock health and performance and improvements in water delivery efficiency far outweigh any potential downsides.

The nature of this proposed project may see irrigation water 'move' from other areas back upstream into the WCPID. This may have consequences of individuals/areas from where water is transferred, but the greater gains in efficiency and productivity that such change would generate far outweigh any potential impacts. It is this 'greater good' that is the important principle that implementation of this project will provide.

The generation of greater water delivery and application efficiency that will result from this project may have some impacts on the local environment. However, the significant water savings that will result from this project will allow more opportunity's for dedicated environmental flows to be directed to areas needed, producing better 'managed and targeted' environmental outcomes. These opportunities exist not just at the broader 'Basin' scale – but also provide the opportunity for environmental water to be delivered within the WCPID at an individual farm scale.

## 3.10. Water savings shared between the environment and water users

Water use within the WCPID is highly variable season to season, and are the result of several factors, including:

- Seasonal conditions experienced locally
- Water availability (which includes factors relating to seasonal allocations and availability and cost)
- Enterprise mix at the farm level
- The ability to use water – a reflection of both District and farm level infrastructure.

As such, it is impossible to determine a single value of water used and therefore saved as a result of implementation of this project. Premise was commissioned by WCPID to prepare an Overall Design Report to support the Options and Preliminary Design Development for the modernisation of the WCPID Scheme. This report outlines the various sources of water loss within the WCPID.

That said, in a typical or 'average' year, implementation of this project will result in direct water savings of approximately 8,380ML/year.

These savings are attributable to a range of factors including:

- Reduction in the WCPID network footprint – with associated reductions in operational losses including seepage, leakage, evaporation and channel wet-up
- Accurate metering
- Improved water management, resulting in improved water delivery efficiency
- Reductions in escape flows
- Provision of piped stock and domestic water supplies (ie. no reliance on the irrigation delivery network to provide S&D requirements).

In addition to these savings which are directly attributable to implementing the project, there will also be significant opportunities to rationalise (reduce) the volume of water entitlements the WCPID Board holds as a result of improvements in water management and reductions in operation losses.

This Board held entitlement is currently used primarily for satisfying conveyance requirements to operate the delivery system (rather than for on-farm irrigation), as like other Private Irrigation Districts (PID's), WCPID holds no specific conveyance water entitlement.

These Board-owned water entitlements are used annually within the Scheme to underpin the delivery of members' water and/or to increase water availability to members. In addition, the Scheme uses components of its entitlement to ensure water is available in the subsequent irrigation year to ensure sufficient capability to deliver Members' water – both irrigation and stock and domestic.

To the extent the proposed infrastructure upgrades will reduce the need to use these volumes for conveyance purposes, then these volumes are deemed as water savings.

As such, it is estimated that (up to) a further 9,420ML of 'rationalisation' water entitlements will no longer be required as a result of modernisation. This entitlement can therefore be returned to the environment as a component of a modernised WCPID.

The total volume of water savings identified from this project are approximately 17,800ML.

Further, the improvements in water supply, reliability and flexibility at the district level should result in greater efficiency gains at the individual farm level. This will be driven by individual landholders who will be encouraged to undertake further irrigation efficiency investments at the farm level, as a result of the greater confidence and reliability of water supply, and the efficiency of the delivery system which will result from this project.

These additional savings have not been considered as part of the assessment of this project but will nonetheless be substantial and add significantly to the cumulative benefits of the project.

All the water savings directly attributable to the project will be fully returned to the Commonwealth for use of the environment. Any additional savings that may be generated by this project would be shared between the irrigation network and its members.

The water savings are shared in alignment with the principle the region is in a "net" better position with regard to socio-economic outcomes as a result of completing this project.

*Table 3.4 Total water savings on completion the project*

| Description | Project water savings (ML/yr) | Entitlement returned to CEWH |
|---|---|---|
| Stock and domestic scheme | 3,250 | 3,250 |
| O'Dwyer Main modernisation | 100 | 100 |
| River Pump delivery pipe | 50 | 50 |
| Lateral channel modernisation | 3,280 | 3,280 |
| Lateral channel rationalisation | 1,700 | 1,700 |
| Rationalisation of delivery entitlement requirements | 9,420 | 9,420 |
| **Total Project** | **17,800** | **17,800** |

## 3.11. Overall value for money

WCPID is seeking $154,630,2558 to deliver the project.

The costs have been based primarily on the findings of individual reports completed as part of the feasibility study which has informed this project development.

The costs were determined based on current industry standards and costings and are verifiable and importantly realistic.

As part of completing a feasibility study into the merits of modernising the WCPID, a cost benefit analysis (CBA) was undertaken by Marsden Jacob Associates (Marsden Jacob, 2023).

In accordance with the guidelines, the CBA focused on the incremental costs and benefits associated with the project options relative to the Base Case.

The incremental costs included:

- capital expenditure for constructing the new infrastructure;
- operating expenditure for continued operation and maintenance of the new infrastructure;
- renewal costs for future replacement of the new infrastructure; and
- economic costs of water recovery, which applies to volumes that are currently (base case) used on-farm/for irrigation but will be returned to the environment under the option cases.

The incremental benefits included:

- economic benefits of water recovery when volumes are to be used on-farm to support additional irrigated cropping or stock and domestic use (expansion of existing production);

- producer surplus benefits from increased efficiency of existing and future on-farm activities (measured in additional gross margins returned per hectare for irrigation or stock and domestic);
- avoided water carting costs, or the avoided economic cost of water tanker deliveries that WCPID would otherwise incur;
- avoided conveyance losses, and/or the avoided need for the NSW Government to issue up to 3,000ML in Temporary Critical Conveyance licenses under drought conditions; and
- benefits from the value of saved water transferred to the CEWH that can be used to support environmental outcomes.

Apart from the range of benefits identified and used in the analysis, the CBA indicated a multitude of additional benefits which would likely result from modernisation, which are difficult to quantify from a purely economic value perspective.

Some of the unquantified benefits outlined by the CBA include:

- Improved mental health outcomes for the WCPID community through more resilient agricultural systems. A more reliable water delivery system would provide demonstratable benefits to water security, reducing impacts of drought and low water availability.
- Improved Work Health and Safety outcomes for WCPID staff, particularly around reductions in driving, field work, manual handling, and hazard minimisation outcomes.
- Regional economic benefits from higher-value agricultural production due to reliable water delivery.
- Environmental benefits from reduced vehicle and electricity use, aided by solar power.
- Enhanced bushfire fighting capability for the NSW Rural Fire Service through specific tank fittings and standpipes.
- Improved quality of life provided by improved water quality.
- Enhanced ecosystem service delivery benefits, including the ability to better manage groundcover and soil outcomes, ability to provide water to wetlands and the ability to transfer water from the Murray to the Murrumbidgee systems.

Based on the CBA analysis completed, this project results in a positive NPV and a BCR greater than one. From a purely economic perspective, this project would have a positive outcome for the investment.

## 3.12. Water saving assumptions

The water savings attributable to this project have been determined from a range of sources.

Existing water losses have been identified through measurement, evidence-based calculations and data and reporting collected by the WCPID itself. The water losses have been determined as a result of an in-depth study conducted by Premise Australia as a component of the feasibility study, and are valid, defensible and realistic.

The water losses have been compared against similar (un-modernised) irrigation delivery networks and were found to compare similarly.

The water savings have been determined based on the implementation of a range of strategies and construction of certain infrastructure.

Water savings are based on the following assumptions for the two sub projects as listed in the following sections.

### 3.12.1. Sub-project 1 – Construction of a S&D system

The water savings specifically identified as part of the S&D system are based on actual measurement data obtained during periods of non-irrigation water delivery (ie. no water available for irrigation purposes).

During the 2018-2020 period when there was 0% General Security water allocation determinations, WCPID was required to supply a so-called 'stock and domestic run' where water was supplied to landholders for stock and domestic purposes only (for example, filling of house or stock dams).

Information provided by WCPID indicated that following pumping of approximately 3,700ML of water from the river pump station resulted in approximately 500ML being delivered (metered) to Members. Conveyance losses of approximately 3,200ML (seepage, channel wet up, evaporation losses, 'dead water' within channel pools etc) were identified as the major components of these losses (Hamilton*, pers. comm*.)

These losses were identified for one single 'water run'. If multiple delivery runs in any one season were required, the cumulative losses (and therefore savings) would be significantly greater.

### 3.12.2. Sub-project 2 – Modernisation of the irrigation delivery network

The water savings identified as a component of modernisation are derived from a number of sources, including:

- reductions in conveyance losses as a direct result of infrastructure rationalisation
- direct remediation of leaking supply delivery pipelines
- improvements in measurement accuracy
- reductions in unaccounted for escape channel outflows
- reductions in unmetered water take.

The water savings are based on physical measurements and laboratory geotechnical assessments completed as part of the feasibility study and are verifiable and defendable.

It has been determined that current losses within the WCPID supply network are in the range of 10-15,000ML/year, depending upon seasonal conditions, antecedent conditions and water availability.

This equates to losses (from all sources) of approximately 29% of total water measured at the offtake point. Implementation of this entire modernisation project will result in direct water savings of over 8,000ML/year. After implementation, losses will be reduced to approximately 12% of the total volume pumped.

These losses and proposed savings are within industry standards and ranges and are therefore considered to be realistic and achievable.

In addition to these direct water savings, there will also be significant opportunities to rationalise (reduce) the volume of water entitlements the WCPID Board holds.

This Board held entitlement is currently used primarily for conveyance purposes.

These Board-owned water entitlements are used annually within the Scheme to underpin the delivery of Members' water and/or to increase water availability to Members. In addition, the Scheme uses components

of its entitlement to ensure water is available in the subsequent irrigation year to ensure sufficient capability to deliver Members' water.

To the extent the proposed infrastructure upgrades will reduce the need to use of these volumes for conveyance purposes, then these volumes should rightly be considered as water savings. It is estimated that these savings equate to approximately 9,400ML.

## 3.13. Secure Water Supply to Towns

Implementation of this project will result in a significant improvement in the secure supply of non-potable water to a number of villages within the area – specifically Daysdale, Savernake and Rennie.

Currently, these villages are reliant on supplies from the West Corurgan irrigation water delivery network. This supply can be unreliable in terms of both quantity and quality. Implementation of the S&D system will see substantial improvements in reliability, security and quality of water supply, significantly improving the 'quality of life' the residents of these villages experience.

Options have also been discussed with the three councils located within the WCPID footprint regarding the potential for these LGAs to augment other towns within their jurisdictions water supply(s). These discussions were preliminary only, with varying levels of interest being expressed. Until (and unless) this project is approved, it is unlikely any commitments would be made by either or any parties. Letters of support have been provided by each of the three councils who are broadly supportive at a high level of the project. Should the project proceed, more specific and detailed consultation would be undertaken with each of the three local government authorities.