Boxyards Road Water: Stock and Domestic Pipeline Project

Assessment against Socio-Economic Criteria as part of the Off-Farm Efficiency Program

November 2023

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Section 1: Overview

1.1 Project Summary

The Boxyards Stock and Domestic Pipeline project will greatly improve water quality and security for Boxyards Road water users and increase delivery efficiency to create long-term water savings and return water to the environment. This project will increase the current water delivery efficiency from the current rate of 11% to over 95% - benefiting both landholders and the environment.

The Boxyards Road Water Group is proposing an **$8,812,520** stock and domestic pipeline system, groundwater bore and desalination plant project that will deliver water savings for the environment, increase water security and climate resilience in the agricultural sector, increase gross regional product and promote social and economic wellbeing for landholders and their community.

The project involves the construction of:

- 43.2km stock and domestic (S&D) pipeline system to supply filtered water to properties along Boxyards Road, Booligal.
- groundwater bore with desalination plant to ensure water security during drought, storage tanks at the pump site and filtration site.
- six on farm water storage tanks to mitigate system outage.

The project will result in the return of **340ML** of Lachlan River Domestic and Stock water entitlements to the environment.

1.2 About Boxyards Road Water Users Group

The project is located in the Hay District of South-Western NSW across the traditional lands of the Wiradjuri people. This rural region covers 11,326 square kilometres of land. The Hay LGA encompasses the township of Hay and villages of Maude and Booligal with a population of approximately 2828 (2021 Census). The area is renowned for its agricultural industry particularly in wool, rice and cotton. In 2022 the Gross Regional Product (GRP) of the region was $189 million with Agriculture accounting for 40% of total GRP.

The Boxyards Road open channel scheme was constructed in the 1960s to supply irrigation and domestic and stock water to four properties near Booligal in the lower Lachlan Valley. The channel is predominantly used to provide water for domestic and stock purposes and, to a lesser extent, for irrigation.

The Boxyards Road landholders currently obtain their Domestic & Stock (D&S) water from various sources, including:

- Extraction from the Lachlan River using open channels through licenced works and volumetric stock and domestic licences.
- Riparian extraction from the Lachlan River, Muggabah Creek, Merrimajeel Creek and Merowie Creek.
- Licenced non volumetric extraction from Muggabah Creek, Merrimajeel Creek and Merowie Creek.
- Surface water runoff and capture in open dams.
- Ground water bores.

Water was delivered through the Boxyards Road Water scheme for over 60 years. The scheme was administered via an informal cooperative arrangement, and an unwritten supply agreement between the landholders which includes a Works Approval for a Joint Water Supply Works.

Boxyards Road Water is a group was formalised in 2020, formed by the five landholders on Boxyards Road which extends in a south westerly direction from the village of Booligal. In June 2023, Boxyards Road Water became a legal entity as an incorporated association with elected officer bearers and the acceptance of the constitution. The proposed new pipeline will generally follow the channel and farm tracks to supply filtered water from the Lachlan River to all five properties along Boxyards Road.

Investing in the future

The Lachlan River has a documented history of running dry. In 2009 the river stopped flowing for four months. Currently the Boxyards Road water users receive their water (unfiltered) from the Lachlan River via channels or via transport by road during dry years. Some people have bores in place for water access however the water quality is poor and is only accessed when there is no other option. In dry times, water carting at high cost and with minimal agricultural production opportunities is common.

It is currently challenging to operate primary production businesses in this region with limited confidence in the ability to access water at a reasonable price, at an appropriate quality and with existing delivery arrangements. This means that producers err on the side of caution and do not produce to their full potential. It also means that in dry times, business de-stock sooner or reduce irrigation - affecting their productivity and profitability. Rebounding from adverse events is also slower and the delay to returning to business as usual is often longer.

To mitigate zero water supply in the future the project will drill a groundwater bore and install a desalination plant. This will ensure that landholders have access to water when the Lachlan River runs dry. The desalination plant is necessary as the groundwater at Booligal has relatively high salt levels. The groundwater, without desalination, is known to kill gardens, reduce stock production (meat/wool), degrade household water infrastructure and cause skin irritation in humans. The groundwater bore and desalination plant will significantly mitigate the impacts of climate variability, that are resulting in more irregular water supply, and provide increased water security.

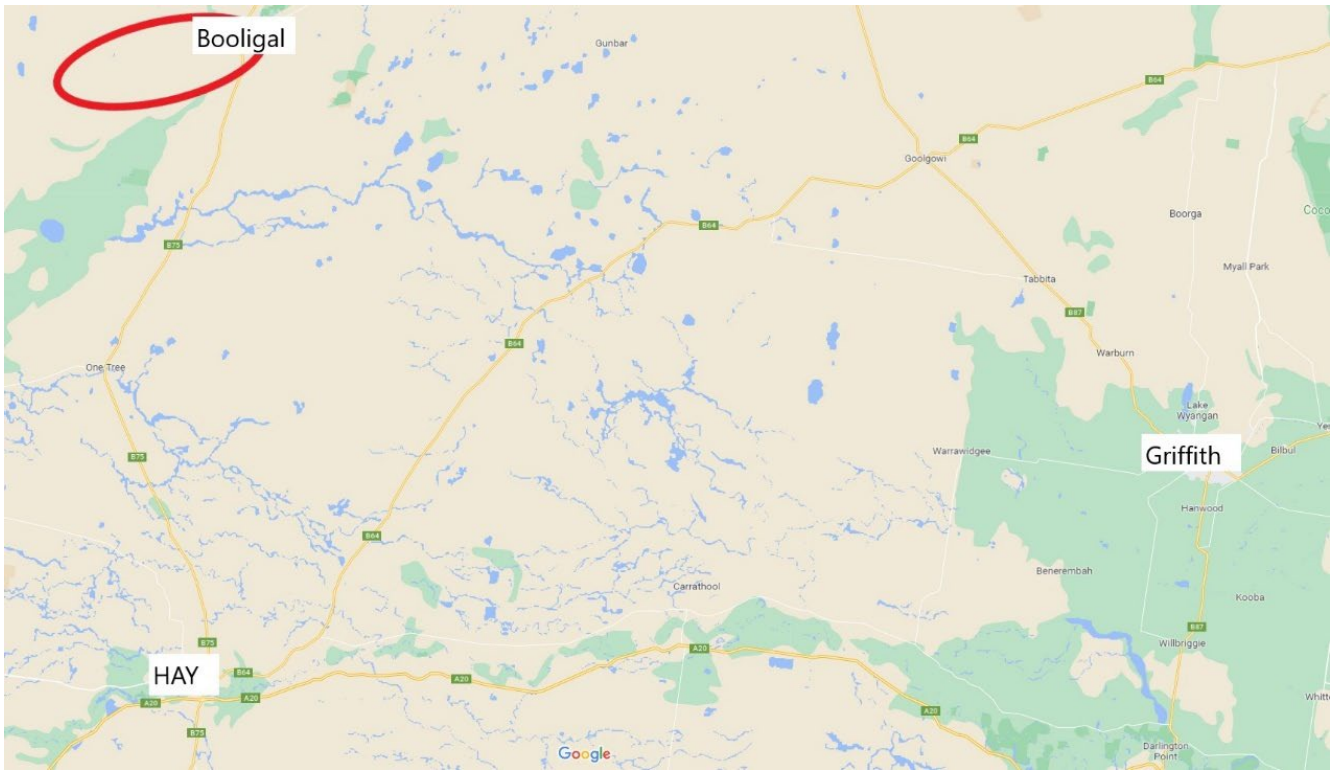


Figure 1: Location of project to the region (in red)

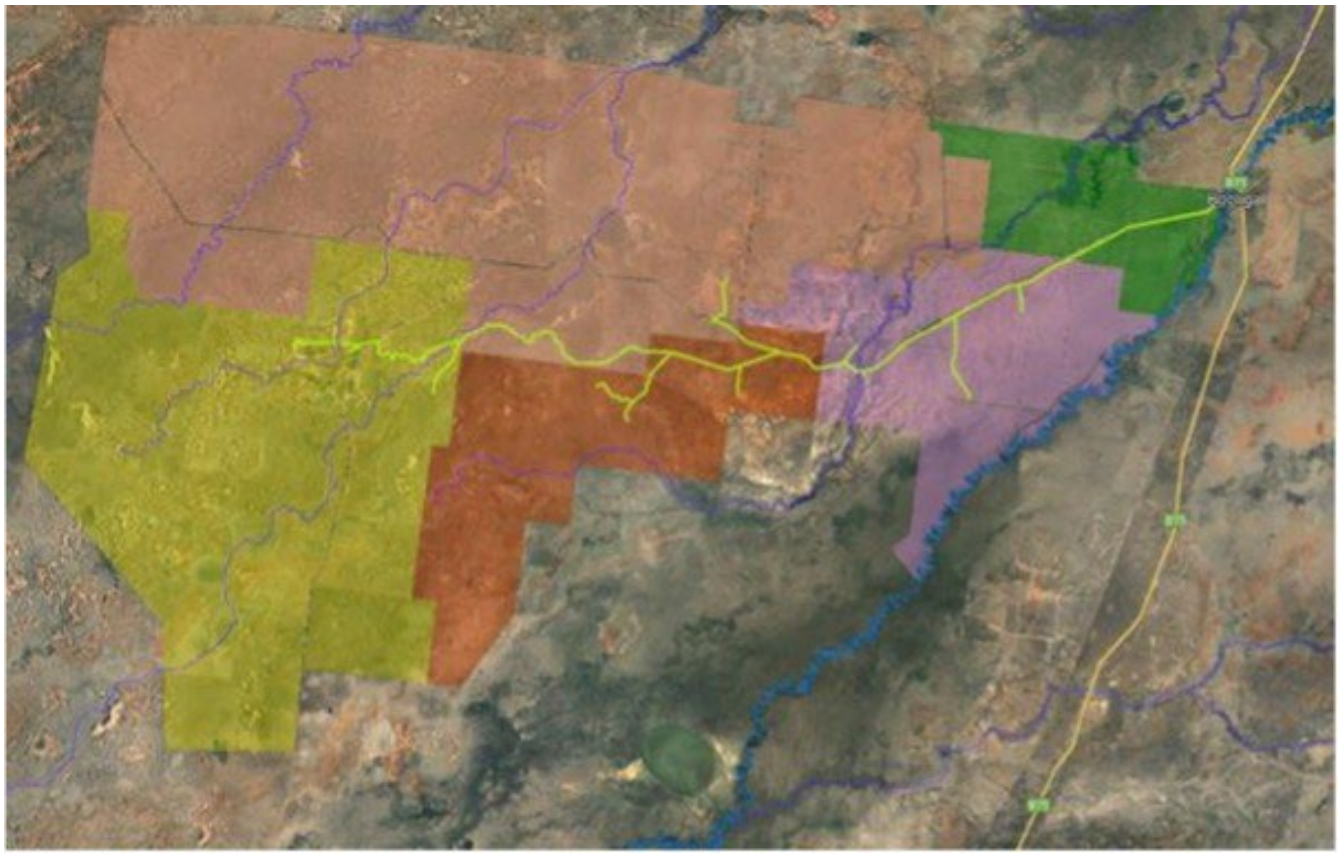
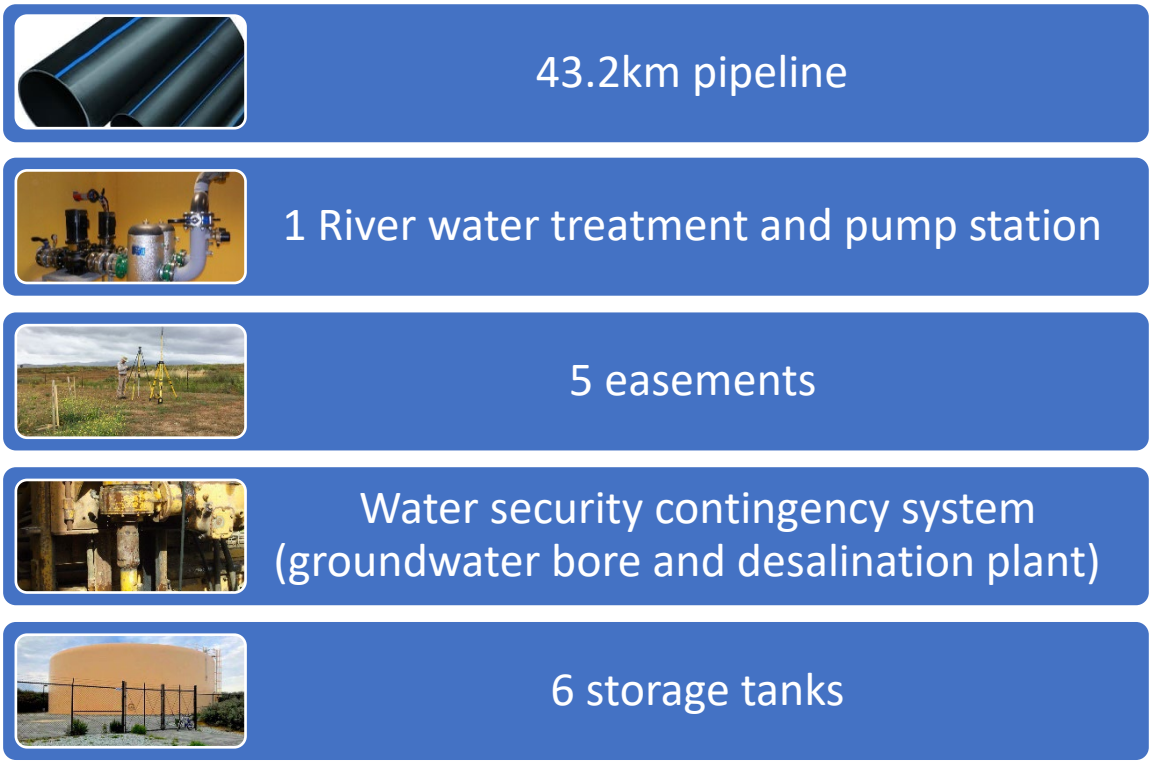


Figure 2 shows the existing S&D and Irrigation channel, source: Pinion Advisory, 2023

Section 2: Project Description

2.1 Project outputs at a glance



2.2 Project Scope

In August 2022 the Gunbar, Hay, Booligal, Carrathool and Goolgowi (GHBCG) Water Group was awarded $1.24 million under the Off-farm Efficiency Program to investigate the feasibility of providing increased water security and quality to the Hay region through modernising existing water delivery systems and constructing new infrastructure, and included the Boxyards Road water users. The feasibility project findings have informed the Boxyards Road project proposal.

The Stock & Domestic pipeline will improve water quality, and result in more efficient delivery to the five landholders on Boxyards Road. The proposal also includes a groundwater bore with desalination plant for water security. In the future, the groundwater bore could also potentially be utilised for Managed Aquifer Recharge (currently not legislated in NSW). The proposal will include a pump and filter station near Booligal and an underground pipeline supply to water tanks on the properties. The modernised single water delivery system will result in:

- Improved delivery efficiency from 11% to 95%, (for every 100ML pumped/95ML used under new system)
- Achieve average water saving of 437ML per year
- Return 340ML of domestic and stock water entitlements for the environment

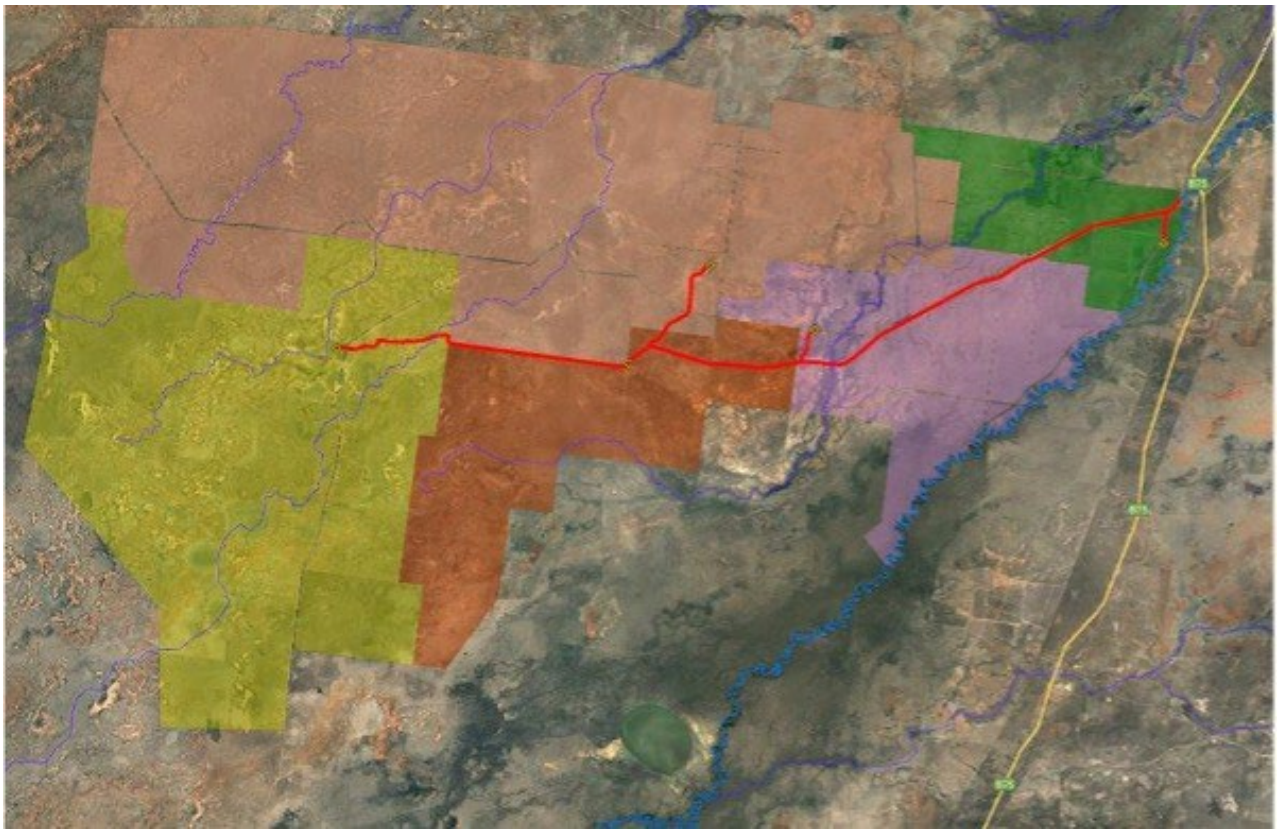


Figure 3 shows the proposed S&D pipeline, source: Pinion Advisory, 2023

2.3 Project Delivery

Concept designs for the Boxyards project have been explored to optimally utilise the water resources, minimise wastage, and maximise water accessibility for both domestic use and irrigation needs. The concept designs take into account factors such as terrain, hydrology, and community requirements, enabling the construction of a pipeline that is not only cost-effective but also environmentally sustainable. The designs allow for thorough scrutiny of potential challenges and provide opportunities for innovative solutions, ultimately leading to a more resilient and dependable water infrastructure solution.

2.3.1 Licencing and Approvals

Boxyards Road Water Group proposes to engage a specialist water infrastructure project manager to oversee the program of works including the delivery of all necessary planning approvals.

As part of the feasibility study a thorough review of the required licences and approvals necessary for the delivery of the Boxyards Road project was conducted. Works include a Statement of environmental effects, Development applications, Applications for owners' consents (Crown Lands), cultural heritage surveys and biodiversity offsets. Consent is required for works in road reserves, licences are required for Crown Licences and Works Approvals.

Boxyards Road group have engaged with the Hay Local Aboriginal Land Council (Nari Nari Tribal Council). The group have committed to use local First Nations groups for cultural heritage studies.

Section 3: Socio-Economic Criteria

3.1 Preparing for the future

It is critical that primary producers and rural communities prepare for climate change by investing in water efficiency infrastructure. Climate change is already manifesting through altered weather patterns, including prolonged droughts, heatwaves, and unpredictable rainfall. These changes directly impact water availability, making it essential to manage water resources more efficiently.

By investing in water efficiency infrastructure, Boxyards Road Water will enhance their resilience to climate-related challenges. Efficient and modernised water distribution networks and water storage facilities will enable efficient utilisation of limited water supplies and maintain agricultural productivity even during periods of water scarcity.

The project will contribute to long-term sustainability by conserving water resources and reducing overall water consumption. This not only helps mitigate the impact of climate change but also supports the ecological health of the Murray Darling Basin, preserving the environment and biodiversity for future generations.

Additionally, preparing for the future through water efficiency measures fosters social cohesion and community resilience. Collaborative efforts to manage water resources more effectively can bring rural communities together, facilitating the exchange of knowledge, best practices, and the development of adaptive strategies.

With each new generation that settles in the area, a higher level of living standard is expected. For generations, technological improvements have helped to realise these improvements – from electricity in the 1980's to digital connectivity in the 2000's. What has not changed in more than 60 years is the quality and security of water to these families. Poor quality water has impacted:

- health, (skin conditions are common amongst the group)
- productivity (livestock do not reach peak production potential)
- mental health (increased stress due to decreased water security)
- social decline (movement of population to areas with better water security and quality).

The project will build climate resilience into the small community. The community of Booligal comprises the Booligal village and the wider community of 50 landholders and workers living on isolated rural properties within 40kms of the village. The project will service five landholdings, which includes 8 permanently occupied households housing 28 people.

Better quality water delivered efficiently increases the liveability of the area. Increased liveability encourages population stability and increased water security enables families to plan and to invest in their homesteads and gardens. It also encourages the migration of new members to the community, through increased employment and generational return.

A stable population, that encourages generational movement to the region, increases the community capacity with new skills bought to the region as young farmers return to primary production. This embeds resilience and results in growth both economically and socially within the community.

3.2 Benefits to industry

The project will provide better business resilience for the associated farm businesses, through stock and domestic water delivery. This will allow consistency of production year in year out, scope for further employees of those associated businesses through possible expansion, increased efficiency and profitability. This project will also provide better quality water to be delivered for stock and domestic use, providing higher animal welfare standards and better household living standards along the network.

Water users on the Boxyards Rd system primarily use the land for raising cattle and sheep. There is some irrigation occurring for hay and lucerne which supports fodder production. The project will supply water to 51,500 hectares of livestock production and will deliver increased productivity outcomes via improvements in livestock management.

Discussions with landholders in the region identified that shifting from lower to high quality and pressurised water supply delivers significant improvements in animal weight gain. They noted that productivity improvements of between 5 and 8 percent have been measured on the properties that are supplied from the similar domestic and stock systems as a result of the lower mineral content of surface water supplies (particularly salt content) and ability to better manage on-property grazing pressures. Australian Wool Innovation report that as the salt concentration increases, stock drink increased water, compared to drinking fresh water. At highest salinity levels, food intake will decline (Livestock water supplies, FS No. 01/07, Primary Industries and Regions SA).

Livestock production is known to be impacted by water quality. Higher quality water leads to increased weight gain, fertility and wool production. This is a critical factor during drought when stock are consuming poor quality feed and require higher volumes of water. Higher water quality, lead to better feed utilisation particularly in ruminants.

The current system exposes livestock and humans to blue green algae outbreaks, particularly in a warming climate. Algae toxins are fatal to livestock and are linked to serious health conditions in humans. The proposed new system includes an algae treatment system which will remove detrimental impacts for livestock and humans.

More consistency in production, will allow more stable spending of input costs to local businesses, contractors and employees. This underpins a more robust social fabric to townships and vibrancy to local businesses, schools and sporting clubs.

With lower conveyance losses and pumping costs, the viability of agricultural productivity will increase, it will allow more consistency of production from year to year, allowing landholders to produce in years they would not normally be able to.

It will allow the landholders production systems to become more profitable, freeing up capital for further on farm development, and allow businesses to be more efficient and sustainable in the long term.

Benefits to Local Economy

Local contractors will be engaged to deliver the program of works, maximising local economic impact. The applicants consider that this is possible because the works will primarily involve installation of civil infrastructure, including pump stations, and pipelines and channel upgrades and there are many skilled local contractors who have been involved in supporting similar modernisation projects in the area. The projects will target 90% of expenditure being directed

toward local (Riverina based) contractors and suppliers, thus achieving a high local employment outcome.

This approach will increase local employment and provide upskilling opportunities, with significant flow on benefits to the wider community. The proponents will leverage established relationships with suppliers in the local and the wider Riverina area. These relationships extend from procurement of services and products for civil works, including earth moving, gravel supply, concrete, pipes, formwork, hire of heavy machinery, and the supply of automation hardware and software.

A local approach to delivery

It is proposed that Boxyards Water Group work in collaboration with Elwah Pumpers, who are also submitting an application under the Off-farm Efficiency Program. Both projects are in the Hay LGA and in working together there is an opportunity to realise economies of scale. It is proposed that the projects engage a Project Manager to deliver both projects. The group would form a Project Steering Group (PSG) to oversee the projects. Financials would be kept separate for each entity. A local delivery approach will be adopted to deliver this program of works. This provides significant benefits in terms of both value for money and flexibility of delivery (through collaboration on resources and procurement processes with Elwah Pumpers). Importantly, both Boxyards Water Group and Elwah Pumpers are proposing to target local contractors to deliver the works. Boxyards Road Water have discussed local capability and content with local water infrastructure specialists These entities have the ability to deliver part/all of the project and have expressed interest in being involved in the procurement process.

3.3 Benefits to community

The proposed project provides an opportunity to realise significant community and regional benefits and increase water savings, setting up water users for the future. One of the key benefits to the community is that increased water quality will directly impact the liveability for landholders encouraging families to stay in the area. During the millennium drought all of the families in the Boxyards Road Water Group needed to buy tank loads of water to meet their household water needs. Families were forced to choose between washing or bathing. Gardens were collateral damage, and none survived the drought. The impact of this hardship, on the mental wellbeing of the community cannot be underestimated. The true impact of this is felt in subsequent droughts as families once again make critical lifestyle choices around their domestic water use. To be able to access clean, reliable water for households will decrease the mental health strain and make living and working in remote areas more attractive. With the project having a direct impact a sizeable portion of the local community it is envisaged the increased water security and liveability will lead to a stable population that could assist in growing the wider community, attracting young families and additional employees.

Boxyards Road Water project will deliver a positive economic welfare stimulus to the region including embedded climate resilience in the community, increased economic productivity, a healthier environment and job creation.

The project will deliver economic benefits to the Hay LGA. By reducing water wastage and optimising agricultural practices, the Boxyards Road Water users will lower production costs, improve yields, and enhance the profitability of their operations. This, in turn, leads to increased job

opportunities, higher incomes, and a strengthened local economy. The economic impact for the Hay LGA is expected to be 17 jobs created or maintained during construction and 1 ongoing role post construction.

Employment benefits through the application of a local delivery model for the construction of the assets that will target 90% local (Riverina region) resourcing. The economic impact of the Boxyards Road project includes:

- Employment benefits through increased productivity and drought resilience, thereby both increasing on-farm employment and also reducing the boom-and-bust employment cycle because water will be able to deliver efficiently to farm during low water availability periods – where currently the losses are prohibitively high.
- Improved skills from both employment and training that will be gained by use of local resources in both the construction and implementation phases of the project. This is particularly important to help address the declining population. The project will increase economic stability and productivity. This will lead to increased employment opportunities and the ability to attract new workers to Booligal. This will help to rebuild the community services, such as the Public School (in recess due to insufficient enrolments) and the Hotel (reduced hours as a result of declining population).
- Improved mental health outcomes by the increased resilience of the farming systems. Mental health and welfare suffer during periods of drought, the improved system reliability and improved water delivery will provide material benefits to water security. As a result, there will be subsequent gains for mental health and welfare. Improved mental health for landholders means they require less emotional and financial support. In addition, local landholders with improved mental health are better placed to support their local communities in Hay and Booligal. Filtered non-drinking water will be supplied to the property homesteads for washing, chemical mixing, and gardens - create natural cool refuges for mental, social, and physical health in harsh landscapes.

It is crucial that these socio- economic benefits are recognised as major benefits resulting from this project.

3.4 Environmental benefits

In addition to the return of 340ML of water entitlements for environment, the projects will deliver local environmental benefits including:

- The extraction rate of water to Boxyards Rd properties from the Lachlan pool upstream of the fish ladder will be reduced so less aquatic fauna will be removed
- The lower extraction rates will have far less impact on low base flows in the Lachlan River
- Disused and rationalised channels will be backfilled to restore grasslands and shrublands and allow flows along natural drainage lines
- Less water will need to be taken from bores and regulated creeks by Boxyards Rd water users, in a region where groundwater levels are declining

3.5 Supporting the Murray Darling Basin Plan

The 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 340 ML 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 and economic growth in rural communities. By supporting primary producers and other water users in maximising water use efficiency, the project fosters stronger and more sustainable regional economies.
- **Stakeholder Collaboration:** The success of the Murray Darling Basin Plan relies on collaboration among various stakeholders, including farmers, communities, environmental groups, and government agencies. The implementation of the project involves engaging and collaborating with these stakeholders, promoting a cooperative approach to water management, and advancing the broader goals of the basin plan.

3.6 Cultural impacts and benefits

The Boxyards Road Water Group Project covers the traditional lands of the Wiradjuri peoples and is in the Hay Local Government Area.

Boxyards Road have engaged with the Hay Local Aboriginal Land Council (Nari Nari Tribal Council). The group have committed to use local First Nations groups for cultural heritage studies. In addition, the group have committed to use local First Nations organisations to deliver parts of the infrastructure project where possible.

3.7 Community support and engagement

The project has been developed following extensive consultation and has the support of customers, Government Water and Land Services departments, local member, Rural Fire Service, Local Aboriginal Land Council, local water advisory groups and Regional Council.

3.8 Positive Economic Outcomes

3.8.1. Management of future lifecycle costs

Boxyards Road water users will use a fixed and variable charges approach to funding the lifecycle costs. This approach comprises:

- Fixed charges for water supply will be function of the volume of delivery entitlement held by the landholder. A renewals annuity approach will be used whereby the renewals annuity recovers the cost of forecast asset renewal and rehabilitation expenditure through a smoothed annualised charge. The fixed charge will cover the estimated capital costs associated with maintaining the water supply assets, along with any fixed charges payable to government.
- Variable charges for water use will reflect the annual operating costs and any water usage related charges payable to government.

3.8.2. No impacts to the water market

The water savings are generated by preventing 437ML of losses throughout the scheme. The saving of these 437ML of losses are due to reduction in evaporation and seepage through:

1. Delivery of water through open channels
2. Storage of water on farm in open earthen dams

There will be no reduction in the amount of water available for consumptive use and Boxyards Road Water's net water balance will be increased by water savings exceeding the volume of water provided to the environment. As such, there are no negative impacts on current water allocation enhancements provided to properties serviced by the Boxyards Road Water S&D pipeline project.

The 437 ML in savings identified are Domestic and Stock entitlements. As such, the water is non tradeable and will not have an impact on the water market. In addition, as the entitlement is not tradeable, without the Off-farm Efficiency Program there is no mechanism for the group to realise the value of the asset to invest in an efficiency project to improve productivity and return water to the environment or deliver socio economic outcomes.

3.9 Water savings shared between the environment and water users

Current long-term water use for the Boxyard Road Water users is 492 ML/year of Domestic and Stock water entitlements. The project will reduce the annual consumption to an average of 56 ML/year while increasing productivity and delivering improved liveability.

The project will result in water savings of 437 ML/year. Of the 437 ML/year, it is proposed that 340 ML Domestic and Stock water entitlements will be offered to the Commonwealth Environmental Water Holder via the Off Farm Efficiency Program, a return 78% of identified savings.

The efficiencies delivered by the pipeline means the remaining 97ML will not be physically used by Boxyards Road water but will be realised in the environment through retention of the water within in the Lachlan River system. It should be noted that Domestic and Stock Lachlan River water is not tradeable so there will be no additional monetary gain to landholders.

The 340 ML returned is the maximum amount of water that can be equitably returned by landholders across the group.

If approved, the project will not only improve water delivery efficiency for stock and domestic water users it will have a life changing impact on members of the Booligal community. It will deliver significant beneficial outcomes for the environment and meet the objectives of the Murray Darling Basin Plan. The project will embed climate adaptability and resilience within rural and remote NSW. More importantly, the project will be an example to the wider community of the benefits of stock and domestic water efficiency projects that deliver water security and quality to rural Australia.