Government of South Australia
Department for Environment and Water

SOUTH AUSTRALIA - ADDITIONAL EFFICIENCY MEASURES CRITERIA ASSESSMENT OUTCOME

Project Reference No:	278878
Outcome:	Compliant with the Efficiency Measures assessment
Date recommended to proceed to public comment	19 May 2021
Date recommended to proceed to the Australian Government's detailed assessment stage	25 June 2021

Overview

This project involves the installation of an automation and control system across two almond orchards with a planted area of 25.0ha located near Renmark in the SA Riverland region. An automatic weather station will be installed on one of the orchards to collect site specific evapo-transpiration data to assist with irrigation management and other weather data to optimise orchard management practices.

The primary water savings will be generated through the installation of an irrigation automation and control system across two orchards which are located approximately 2.0 lineal kilometres from each other. The current irrigation systems are operated manually and therefore having orchards across two separate sites is challenging and leads to inefficiencies with irrigation scheduling. Solenoids and hydraulic valves will be installed to enable the automation and control system to be fully integrated into the existing on-farm irrigation systems.

The works are expected to generate an increase in yields (t/ha) which will have a direct positive impact on the financial viability of the business and assist it to remain viable into the future. There will also be considerable orchard management efficiencies that will be achieved through having an automated irrigation system and eliminating the need for travel between sites. All goods and services will be supplied by, and/or completed by local contractors and therefore program investment will remain in the region and provide a direct economic stimulus.

The works will facilitate improvements in on-farm irrigation efficiency which will ensure that high value environmental assets such as nearby floodplains, wetlands, creeks and the River Murray are protected and enhanced. The project is located within the Renmark Irrigation Trust (RIT) network who work in partnership with the Commonwealth Environmental Water Holder (CEWH) to deliver e-water to priority ecological sites and assets via the trust delivery infrastructure.

A conservative water saving of 3.0ML, or 0.12ML/ha per annum is expected to be generated from the project works.

Part 1 - State Assessment - Efficiency Measures criteria

Assessment Approach

This State Assessment is reliant on the information provided by the applicant. The comments provide a summary of the information provided by the applicant which is deemed relevant by the assessor to demonstrate that the Efficiency Measures – Agreed Criteria have been met.

Water Savings Substantiation

The water savings expected to be achieved by the project have been verified by an Independent Approved Irrigation Professional.

The water savings substantiation is provided at Attachment A.

The project is expected to return a conservative 3.0 ML to the environment, with the applicant retaining 9.5 ML of water savings.

Water Saving Component	Area ha	Water Saving (ML/ha)	Estimated Water Saving (ML)	Total volume of Eligible Water Rights offered for transfer (ML)
Full Cover to Partial Cover Sprinkler	25	0.5	12.5	3.0
Total Water Saving			**12.5**	

Efficiency Measures Criteria	Project Responses to Efficiency Measures Criteria	Adequate Response Y/N	State Assessment
Evidence of engagement with community, industry and government agencies during project design (Criteria 9, 6a, 6b)	6a. Please refer to Attachment B (Renmark Irrigation Trust Summary). 6b. The Delivery Partner was engaged by the Australian Government in December 2018. Since this time the Delivery Partner has undertaken extensive consultation on the Water Efficiency Program with key stakeholders. Direct engagement with industry and commodity groups, irrigation infrastructure operators, Local Government, Regional Development organisations has occurred on the program. The works proposed through this project are consistent with regional plans, priorities and strategies on sustainable land and water management practices and building resilience and adaptability into the irrigated agriculture sector. 9a. Please refer to the response to 6b. 9b. Please refer to the response to 5b.	Y	The application has demonstrated that the delivery partner has consulted with relevant industry bodies, relevant Irrigation Infrastructure Operators, local governments and regional development organisations on a strategic regional approach to developing projects under the Water Efficiency Program. The application has also provided evidence that the relevant network operator, the Renmark Irrigation Trust, is involved in or aware of the project.
Potential Direct Water Market Impacts (Criteria 7a, 7b, 7c, 7d)	7a. Refer to Attachment B confirming that the volume of water entitlement owned and the period of ownership. The project has been independently assessed	Y	The application has demonstrated that: • The water rights to be transferred as part of the project have been independently verified as a conservative estimate of the water savings that

	which included the provision of formal quotations to establish the budget for the project. This assessment confirms that a conservative volume of the total assessed potential water saving has been nominated for return and that additional savings will be retained by the proponent. The water savings are based on industry benchmarks (crop and irrigation system type specific) that have been collated over a long period of time from local and district on-farm water use studies and investigations. 7b. Attachment B verifies that the nominated water access entitlement meets the 3 year ownership requirement. 7c. This proposal involves the transfer of a nominal volume of water (3.0ML) and therefore is expected to have no direct impact on the reliability of water. This is consistent with other proposals that have been submitted by the Delivery Partner where conservative volumes are nominated for transfer and with retained savings being generated - in this case (9.5ML) 7d. As outlined above in 7c. this project involves the return of 3.0ML of water and therefore will not directly increase the price of water. The works will generate lasting water savings given the permanent horticulture production system that is in place.		can be generated and that the project will not transfer more water than the project will save. • The water entitlements to be transferred have been held for a minimum of 3 years at the time of application. The project will generate water savings above the volume returned to the environment and will effectively increase the water available for productive uses in the consumptive pool. The increase in available water will have no direct impact on reliability and may put downward pressure on water market prices.

	The water savings assessment indicates a total water saving of 12.5ML with a return of 3.0ML so the net outcome is an additional 9.5ML that was previously lost.		
Contribution to Proponent Businesses and Irrigation District Viability (Criteria 4a, 4b, 4c)	4a. As was outlined in 2a. the properties where works are proposed are located within the footprint of the Renmark Irrigation Trust (RIT). RIT has a strong commitment to the adoption of best practice irrigation both with respect to supply of water to customers and customers use of that water. The Renmark community and the broader Riverland region is heavily dependent on the irrigated agriculture sector to drive the economy and therefore projects that invest in the longer term sustainability of businesses are vitally important for ensuring the economic contribution is maintained and enhanced into the future. 4b. The properties where the project works are proposed are located within the Renmark Irrigation Trust which has been a fully piped system since 1975 and services over 600 irrigators. The works are focused on on-farm upgrades that will have no impact on existing supply infrastructure or any other customers within the network. 4c. As was described in 2a. the Renmark Irrigation Trust has a long history of adopting and enabling best practice irrigation management. This project is consistent with	Y	The application has demonstrated that: • The project will contribute to the longer term sustainability of the business and the irrigation district more generally. • The project is focused on modernising existing inefficient irrigation systems, which will position the business to capitalise on returns for almond production in the SA Riverland. • The project will contribute to the longer term viability of the property, which will provide benefits across the trust and irrigation district more broadly, consistent with current business plans.

	that objective and is also well aligned with regional land and water management plans, priorities and strategies.		
Support for Regional Economies (Criteria 5a, 5b, 5c, 5d, 6c)	5a. All irrigation components will be sourced from suppliers based in the region which will ensure the program investment remains in the local community and provides economic stimulus. 5b. Currently the properties are not operating as efficiently as they could be and the proposed works will address the current limitations with irrigation management. The on-farm irrigation efficiency works also assist the proponent to be better adapted to reduced and/or more volatile water availability in the future. 5c. As described in 4b. the properties are located within the Renmark Irrigation Trust (RIT) which has been fully piped since 1975. The proposed on-farm works will not reduce the productive capacity of the trust and no change to the proponent's delivery shares that are held within RIT will occur as a result of the project. 5d. The proposed works will not impact on existing employment or regional jobs noting existing labour is provided by the owner/operators. 6c. While the project will deliver positive benefits to the proponent these benefits will extend beyond the farm gate through	Y	The application has demonstrated that the project will: • Support the almond industry, which is an important sector of the Riverland and SA economy. • Maintain employment along with engaging local contractors during the redevelopment and construction phase. • Generate benefits for the broader region and not just the applicant through the sourcing of local farm input supplies by the participating business and generating regional employment. • Increase regional and Basin wide productivity through increasing the volume of water available for consumptive uses on the water market.

	investment in the local community both for the project works and in the longer term. The works will ensure the properties are viable and sustainable into the future and continue to contribute product to local processing facilities which will assist with underpinning jobs along the supply and distribution chains. The project will also generate retained water savings for the proponent which will assist to increase water supply at a local, regional and Basin scale.		
Social and Environmental Benefits (Criteria 2a, 2b, 2c,)	2a. The property where the works are proposed is located near Renmark in the SA Riverland region. The property is serviced by the Renmark Irrigation Trust (RIT) who were the first agricultural site and first irrigation water provider in the world to be awarded gold level certification by the Alliance for Water Stewardship. A key component of achieving this unique honour is the demonstration of best practice irrigation management in the context of delivering socio-economic and environmental outcomes. The works will deliver improvements in the productivity of on-farm water use and reduce the irrigation induced impacts on the local environment through more efficient practices. The goods and services will be sourced	Y	The application has: • Described the expected socio-economic and environmental benefits of their proposed project, which include: o Increased productivity in terms of return per megalitre for the business and region. o Improving the business' long term resilience and viability, which will have flow on benefits to the local, regional and State economies. o Sourcing of goods and services for the project from local companies, which will add further economic stimulus to the Riverland community. o Increased regional and Basin wide productivity through increasing the volume of water available for

	directly from local and regional based businesses which will mean the economic stimulus generated by the project will remain in, and benefit the local community. The works will also generate lifestyle benefits to the proponent through minimising travel between properties resulting in an improved work/life balance. 2b. N/A 2c. N/A		consumptive uses on the water market. • The proposed works are on-farm and will not affect the amenity value to local communities of weirs, storages and parks. • The project is below the $4 million threshold for large projects and is not required to address criteria 2c.
Comply with all relevant laws including work health and safety laws. (Criteria 2d)	2d. The Delivery Partner has well established WHS management procedures in place which have been specifically tailored to the implementation of Australian Government irrigation efficiency programs. The proponent will be required to complete a Risk Assessment specific to the project activities and demonstrate that all required insurance is in place and current prior to the project works commencing and any funds being paid. The specific works proposed through this project are considered low risk.	Y	The application has demonstrated that the applicant and delivery partner have an understanding of all relevant legislation and/or regulation that will require approval prior to works commencing and that they will comply with all relevant laws including work health and safety laws.
Business Resilience, including Drought and Climate Change Impacts (Criteria 10a, 13a, 12)	10a. Please refer to the response to 5b. 12a. As described in 7a. the project proposal has been individually assessed and the assessment confirms that a conservative volume of the total saving is nominated for return.	Y	The application has demonstrated that the project will: • Modernise existing inefficient irrigation systems, which will position the business to capitalise on returns for almond production in the SA Riverland.

	The projects works budget has also been substantiated through formal quotations. 13a. As has been referred to in previous responses the project works will decrease annual demand with a significant share (~75%) of the total water saving to be retained by the proponent. The reduction in demand and access to retained savings will enable the proponent to be better adapted to periods of reduced and/or variable water availability which is most important for permanent horticulture and which is project will occur more frequently into the future.		• Generate additional water savings that will be retained by the applicant to improve their capacity to better manage periods of reduced water availability. • Provide the enterprise with an increased ability to endure and adapt to future climate variability and water availability by generating productivity improvements and improving profitability.
Cultural Benefits **(Criteria 8a, 8b, 8c)**	8a. The Renmark community and broader Riverland region is synonymous with irrigated agriculture. The Renmark Irrigation Trust (RIT) was formed in December 1893 and is one of the oldest irrigation trusts in Australia. The RIT is part of the fabric of the Renmark community and was recently recognised for its on-going excellence in water management with gold level certification under the Alliance for Water Stewardship. The sustainability of the trust is directly connected to the sustainability of its members and this project will invest in ensuring the longer term viability of an RIT member's enterprise. The RIT has been working in partnership with the Commonwealth Environmental Water	Y	The application has described the expected cultural benefits of the proposed project, including the strategy for increasing the cultural benefit to participants and their communities through local sourcing of goods, services and labour. The total project value is below $3 million and is not required to identify cultural heritage sites and manage any impacts in accordance with relevant Commonwealth and State laws.

	Holder (CEWH) since 2016 to utilise its supply network to deliver water to priority environmental assets in the Renmark community. This partnership directly contributes to recreational and tourism outcomes and it is projects like these that provide water entitlements that the CEWH can strategically deploy both locally and across the MDB. 8b. As described in 8a. this project is a great example of the 'farm to floodplain' concept and the triple bottom line outcomes that are delivered through community and government partnerships. During implementation the project will contribute direct economic stimulus through engaging local service providers and the works will assist with securing employment within the local community. The water recovered through the project will also be used to underpin the longer term health of the Murray-Darling Basin including priority local floodplain and wetland assets which are critical for the tourism sector. 8c. N/A		

In-Principle Recommendation

The application has adequately addressed the Efficiency Measures – Agreed Criteria and demonstrated that the project will have neutral or positive socio-economic impacts and not have negative third party impacts on irrigation systems, water markets or regional communities. Accordingly, the South Australian Government provides in-principle approval for the project and recommends that the application proceed to the **public comment stage**

Part 2 - State Response – Public Comments

Relevant Public Comments to be responded to	Response to Relevant Public Comments
It is clear this project will have negative socio-economic impacts at a broader regional level as there will simply be less water available for agriculture. Any project that decreases the total pool available to food production results in negative outcomes. On-farm projects reduce the total amount of water available to agriculture. While this proponent claims they will become more efficient with their water use, agriculture as a whole in the Basin will be worse off as there is simply less for agriculture to use. South Australia remains the only State not adhering to the agreed socio-economic criteria.	The South Australian Government prefers efficiency measures to recover water for the environment, as they provide real and positive outcomes to irrigation businesses, while supporting communities that would otherwise be hard hit by the reduction in regional productivity or the closure of businesses through water leaving the consumptive pool through buybacks. Unlike water buybacks that remove water from the consumptive pool, efficiency measures increase the volume of water available. Properly constructed efficiency measures projects recover water that is effectively "lost" through evaporation, leaky infrastructure and inefficient irrigation systems or overwatering and is unavailable for use until projects are completed. The water savings for all South Australian on-farm projects have been independently verified as a conservative estimated of water savings. Those water savings were not previously available to the consumptive pool. Additionally, all proponents of on farm projects in South Australia under the efficiency measures program have retained a portion of the water savings generated from their projects. This is increasing supply and putting downward pressure on water market prices. Accordingly, South Australian projects are increasing the water available for consumptive uses across the southern connected Murray-Darling Basin and have not reduced the amount of water available for agricultural use. South Australia continues to encourage participation in on-farm efficiency measures projects to generate positive outcomes for irrigators and regional communities, and is assessing all applications in full accordance with the Murray-Darling Basin Ministerial Council agreed socio-economic criteria.

Evidence suggests that those who participate in on-farm projects do require additional water and do enter the water market, thus driving up the price. There is no guarantee that this project will not enter the market.	Both the ABARE and Aither reports have acknowledged that it is difficult to separate the impact of water recovery from other major trends such as climate change and the significant growth in industries and as such the findings should be treated with caution. The ABARE report draws heavily on a recent study undertaken by ABARES, available at https://onlinelibrary.wiley.com/doi/full/10.1111/1467-8462.12396?af=R This study found that some on-farm program participants subsequently purchased water to increase their irrigated production. The study did not however directly link this to participation in the program and noted that many other demographic and economic factors are likely to influence business decisions. In fact, it is specifically stated that the study did not attempt to define or separately quantify direct and indirect effects of on-farm efficiency measures projects on water prices. The ABARES study also evaluated many projects that would not meet the criteria agreed by the MDB Ministerial Council and as a result, no conclusions can be drawn between the findings of this study and on-farm efficiency measures projects that have been submitted since these criteria were agreed. The Aither report appears to treat water recovered through on-farm efficiency measures the same as buybacks. This fails to recognise that on-farm efficiency measures are reducing demand by the same amount and in most cases more than the corresponding reduction in supply. Accordingly, it would be incorrect to infer that South Australian on-farm projects are directly attributable to increased water use and higher water market prices when they are consistently reducing water demand and increasing supply. Any expansion of irrigated area and hence water use that occurs post on-farm project is an indirect effect of the program and is likely to be driven by many other complex and interrelated economic and social factors. These indirect impacts are not considered as part of the socio economic assessment.

Final Recommendation

The application has adequately addressed the Efficiency Measures – Agreed Criteria and demonstrated that the project will have neutral or positive socio-economic impacts and not have negative third party impacts on irrigation systems, water markets or regional communities. Accordingly, it is recommended that the application proceed to the Australian Government's detailed assessment stage.

Declaration by Independent Approved Irrigation Professional

A: Project details

Assessor Name: [redacted] **Date:** 2/9/20

CID No: [redacted] **Client name:** [redacted]

Project Name: [redacted] **Project No.** [redacted]

Submitted by: [redacted] **Irrigation Equipment by**: [redacted]

B: Project Scope

I declare, as an Independent Approved Irrigation Professional agreed to under the Deed, that:

a) I have carried out the technical and practical feasibility assessment for the Works; and

b) I have had no previous involvement in preparing this Project Proposal.

I certify that the Project Works are technically and practically feasible, including that:

i. the projected water savings they will generate are reasonable and realistic, including being appropriate to the crops, soils, climates, water delivery system and topography of the Eligible Irrigator's Property;

   a. *Comment: The project proposal is to automate the existing sprinkler irrigation system on two properties, comprising a new remote irrigation management system and installation of 11 new solenoid valves together with installing an automatic weather station and new fertigation system on one property. Total project area 25Ha.*

   b. *The projected water savings of 3ML (0.12ML/ha) from the new irrigation system automation upgrades are considered conservative and suitable for the Almond production on this property in the Riverland area.*

ii. the rationale for the water savings assessment is clearly explained;

   a. *Yes, described in Attachment to application. I agree with the methodology used to calculate the water savings. The water savings that should be achieved from the automation (0.5 ML/ha savings from published data) of the existing sprinkler irrigation system are considered a conservative value, realistic and achievable.*

iii. the projected water savings will be achieved while maintaining the agricultural production potential of the Property on which the Works would be completed as part of a Project;

   a. *A calculated 257ML (260ML RIT class 3 entitlement -3ML offer) will be retained by the grower for production. This available volume is insufficient to meet full water requirements of approx. 350ML for the currently planted 25 Ha of Almonds. Additional water will need to be purchased on the open market.*

iv. the engineering solutions they entail are achievable and appropriate to the needs of the Eligible Irrigator and the Property/s;

   a. *The installation of a remote irrigation management system and valves to service the two properties and installation of the weather station are appropriate engineering solutions to improve irrigation system operation efficiency and labour time. The changes are appropriate to meet the needs of the property and irrigator.*

v. the projected costs are reasonable and realistic, and within the expected range for that type of infrastructure and scale of installation;

   a. *Yes, costs are within the range expected for the supply of materials and installation of new sprinkler system remote management system and weather station.*

Signed as the Independent Approved Irrigation Professional for this Project

[redacted]

Name

[redacted]

Signature

2/9/20

Date

Water Savings Substantiation – Water Efficiency Program (WEP) Technical Assessment

Project ID: [redacted]

Crop Type: Almonds

Project Summary:

The applicant is seeking to install an irrigation automation and control system across 25.0ha of almond orchards located near Renmark in SA Riverland region. An upgrade to the fertigation system will be undertaken as part of the project and an automatic weather system will also be installed on one of the orchards to assist with irrigation scheduling.

A conservative water saving of 3.0ML, or 0.12ML/ha per annum is nominated for the proposal.

Water Saving Methodology:

The applicant owns and operates almond orchards at two different sites that are located approximately 2.0 lineal kilometres from each other. The irrigation system is currently operated manually which means that due to travel time and other farm management demands that there are general inefficiencies in managing irrigation across the two sites.

The project works will include the installation of solenoids and also hydraulic valves where required to facilitate the integration of the proposed automation and control system. The automation and control system will be radio controlled and have full remote access and operating capability.

Consistent with benchmarks for this type of irrigation modernisation activity and crop water use (*refer: OFIEP R4 Fact Sheet*) a water saving of up to 0.5ML/ha is expected to be generated through the project works. It is also anticipated that the installation of an automatic weather station will contribute further efficiencies to on-farm water use through the measurement of orchard specific evapotranspiration data which will assist with ensuring that irrigation scheduling best matches crop water requirements. The automatic weather station can also be fully integrated with the proposed automation and control system to create a sophisticated irrigation decision support system.

Water Saving Activity	**Area (ha)**	**Water Saving (ML/ha)**	**Total Water Saving (ML)**	**Conservative Water Saving (ML)**	**Conservative Water Saving (ML)**
Automation & Control System	25.0	0.5	12.5	**3.0**	**0.12**

Project Budget:

Project costs are based on quotes provided by [redacted] **and** [redacted]**.**

Irrigation Design:

As the works are low complexity and only involve automation no formal irrigation design has been provided.

Approvals/Environmental:

No approvals are required to conduct the works as the works are occurring on private property and the activities will not have an adverse environmental impact on the property or surrounds.

Both properties where works will occur are located within the Renmark Irrigation Trust network where a Comprehensive Drainage Scheme (CDS) is in operation. Tile drains are installed on individual properties, with drainage water, fed by gravity, entering into a pipeline system that flows to a system of caissons.

The drainage water joins the State government's salinity management scheme directing water away from the adjacent floodplains. Over time the amount of drainage water entering the system across the RIT has declined with increasing efficiency of irrigation inputs.

The efficiency gains achieved through this project will contribute to sustaining this outcome.

The RIT has also worked in partnership with the Commonwealth Environmental Water Holder (CEWH) to deliver e-water to priority ecological sites and assets via the trust delivery infrastructure.