Government of South Australia
Department for Environment and Water

SOUTH AUSTRALIA - ADDITIONAL EFFICIENCY MEASURES CRITERIA ASSESSMENT OUTCOME

Project Reference No:	50965
Outcome:	Compliant with the Efficiency Measures assessment
Date recommended to proceed to public comment	19 March 2021
Date recommended to proceed to the Australian Government's detailed assessment stage	31 May 2021

Overview

The project will be installing continuous logging probes on 12.0ha of Citrus located near Loxton in the SA Riverland. There will also be a solar system installed to assist in the off-set of pumping costs and allow flexibility in pumping times that will better align to peak plant water requirement.

The installation of soil moisture monitoring probes will provide real-time information to optimise irrigation decision making and remove the guess work from current scheduling practices.

All project works are internal to the property and within the existing irrigated footprint, the works will also ensure irrigation applications best meet crop water requirements meaning there is less water draining below the crop rootzone and needing to be disposed of through regional drainage networks. This will have a positive impact on the health and ecological values of local floodplains and wetlands and the River Murray more generally which will assist local eco-tourism and recreational pursuits.

Water savings in addition to the volume being transferred will be retained by the applicant which will assist with providing greater flexibility and adaptability for the property during periods of reduced water availability. The additional water savings will also increase the volume of water available for production within the consumptive pool.

A conservative water saving of 3.4ML or 0.28ML/ha is nominated for the proposal.

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 3.4 ML to the environment, with the applicant retaining 2.6 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)
Soil Moisture Monitoring System	12.0	0.5	6.0	3.4
Total Water Saving			**6.0**	

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)	9. Please refer to response to 6b. 6a. N/A - Private Diverter. 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 within the SA MDB region. 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 and strategies on sustainable land and water management practices and building resilience and adaptability into the irrigated agriculture sector.	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 proposed project is not located within an irrigation network or trust, so the application is not required to provide evidence that the relevant network operator or water corporation 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 which included the provision of formal quotations to establish the budget for the	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 can be generated and that the project will not transfer more water than the project will save.

	project. This assessment confirms that only a conservative volume of the assessed 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 on-farm water use studies and investigations. 7b. Attachment B verifies that the nominated water access entitlement meets the 3 year ownership requirement. 7c. The project works result in a conservative reduction in annual irrigation demand (6.0ML) however the proponent is only seeking to return a conservative volume (3.4ML) of the assessed saving meaning the net impact is positive post project works from a water demand/supply context. The volume of water to be recovered through this project is also very small and based on best projections of future water recovery potential would represent less than 0.01% of the SDL in the southern connected MDB. 7d. As described above in 7c. this project will generate a net increase in water supply relative to the properties annual crop irrigation requirements and together with the small volume that will be transferred to the Australian Government will not directly		• 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.

	increase the price of water.		
Contribution to Proponent Businesses and Irrigation District Viability (Criteria 4a, 4b, 4c)	4a. This property involved in this project has a private diversion from the River Murray and is not within an irrigation network. 4b. As outlined in 4a. the property is a private diversion and the works are focused on ensuring the long-term sustainability and productivity of the irrigation system. 4c. The applicant is a private diverter and not part of an irrigation infrastructure operator network. The property to be upgraded is however located in the Pyap-Kingston on Murray Land & Water Management Plan Area (P-KoM LWMP). The key objectives of the P-KoM LWMP are to foster sustainable irrigation practices in the region and also to develop landholder capacity to adapt to climate risks and variable resource availability which this proposal is very well aligned 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 citrus production in the SA Riverland. • The project will contribute to the longer term viability of the property, which will provide benefits across the irrigation district. The project is not located within an irrigation network, so the application is not required to take account of relevant irrigation business' strategies or plans.
Support for Regional Economies (Criteria 5a, 5b, 5c, 5d, 6c)	5a. As described in 2a. all materials and labour for this project will be supplied through local irrigation businesses and contractors. The citrus industry is an important sector of the Riverland and SA State economy. This project will ensure the longer term sustainability of a family owned and operated business which employs local people both on a permanent and seasonal basis.	Y	The application has demonstrated that the project will: • Support the citrus industry which is an important sector of the Riverland and SA economy. • Maintain and potentially increase seasonal employment during the harvest period along with engaging local contractors during the redevelopment and construction phase. • Generate benefits for the broader region and not

	5b. This project is directly contributing to an increase in productivity in terms of return per ML. This will provide the enterprise with longer term resilience and viability which will have flow on benefits to the local, regional and State economies. 5c. This proposal is not located within an irrigation district however the works will deliver a direct increase in the productive capacity of the property and therefore by extension to the local region. 5d. As addressed in 5a. the expectation is that additional regional jobs will be created as a result of this project as the productivity of the orchard will improve which will require additional seasonal employment. The works will not result in any reduction to existing on-going employment on the farms themselves. 6c. While the project will deliver significant positive socio-economic outcomes for the participant these benefits will extend beyond the farm gate as a result of direct program investment in the local community and increased productivity which will provide a broader regional and State level benefit. The proposal will also generate retained water savings for the applicant which will increase the volume of water available in the consumptive pool which will deliver benefits at the broader sMDB scale.		just the applicant through the sourcing of local farm input supplies and generating regional employment. • Increase regional and Basin wide productivity through increasing the volume of water available for consumptive uses on the water market.

Social and Environmental Benefits (Criteria 2a, 2b, 2c,)	2a. The works proposed through this project will assist the business to significantly improve the productivity of its on-farm water use.
	
	The works will directly facilitate an increase in annual revenue that is derived from the existing irrigated crops which will assist with under-pinning the current levels of on-going and seasonal employment. All goods and services will be sourced from within the local region meaning the program investment will deliver a direct economic stimulus.
	
	Irrigated agriculture, in particular the citrus industry is a key driver of the Riverland economy and therefore the project will ensure that this important economic contribution continues well into the future.
	
	The Riverland region is also very reliant on tourism and the associated recreation activities that the River Murray provides. This project will ensure that irrigation induced impacts on the River Murray and surrounding floodplains and wetlands are minimised and that the ecological and recreational values are maintained and enhanced.
	
	2b. As this project is small scale and focused on on-farm upgrades only there will not be direct impacts on social values such those community assets described in this criterion.
	
	2c. N/A - Project is under $4 million.
		Y	The application has:
			• Described the expected socio-economic and environmental benefits of their proposed project, which include:
			  ○ Increased productivity in terms of return per megalitre for the business and region.
			  ○ Improving the business's long term resilience and viability, which will have flow on benefits to the local, regional and State economies.
			  ○ Sourcing of goods and services for the project from local companies, which will add further economic stimulus to the Riverland community.
			  ○ Increased regional and Basin wide productivity through increasing the volume of water available for 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.	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 response to 5b. 13a. The project works will decrease annual demand with a portion (43%) of the total 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 are expected to occur more frequently into the future. The integration of the solar system into the irrigation system will also reduce the carbon footprint of the property while also delivering enhanced flexibility with irrigation management. 12. As described in 7a. the project proposal has been independently assessed and this assessment confirms that a conservative	Y	The application has demonstrated that the project will: • Modernise existing inefficient irrigation systems, which will position the business to capitalise on returns for citrus production in the SA Riverland. • Generate additional water savings that will be retained by the applicant to improve the capacity of the proponent 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.

	volume of the total water saving is nominated for transfer. The project works budget has also been substantiated through formal quotations and is consistent with the funding request through the program.		
Cultural Benefits **(Criteria 8a, 8b, 8c)**	8a. As has been outlined in the responses to previous criteria the project is expected to generate positive outcomes at a local and regional community scale. The project works will ensure an existing irrigated business remains viable and sustainable into the future which is very important given the Riverland region of SA is heavily reliant on a prosperous and vibrant irrigated agriculture sector. 8b. This project represents a direct investment in an irrigated business to ensure its longer term sustainability and viability. This outcome contributes benefits at the community, region and State level by underpinning existing employment both on-farm and within the processing and distribution networks. All goods and services for the project will be sourced from local suppliers and contractors ensuring program investment remains in the local community and region. 8c. N/A project is under $3 million.	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.

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.

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

Project ID: [redacted]

Crop Type: Citrus

Project Summary:

The project will be installing continuous logging soil moisture monitoring probes on a 12.0ha citrus orchard located near [redacted] in the SA Riverland. There will also be a solar system installed to assist in the off-setting of pumping costs and allow flexibility with pumping times that will better align to peak crop water requirement and assist with mitigation against extreme heat.

A water saving of 3.4ML, or 0.28ML/ha has been nominated for the proposal.

Water Saving Methodology:

The citrus property is currently irrigated with under tree sprinklers and has no monitoring equipment.

The installation of two soil moisture monitoring probes will provide information to optimise irrigation decision making, the probes are a cloud based continuous logging system which will provide real-time information to ensure irrigation scheduling best matches crop water requirements throughout the growing season. In addition to improving the efficiency of on-farm water use the soil moisture monitoring system is expected to generate productivity improvements in terms of both yield and quality contributing to enhanced enterprise profitability and sustainability.

The installation of the solar system will create flexibility in the system by allowing the irrigator to pulse irrigate during times of peak crop water requirement without the prohibitive cost of power from operating the pumps during the day. The integration of the solar system into the irrigation system will also facilitate an improved capacity to manage extreme heatwave events which are expected to be more frequent in the future in the Riverland region. Short pules of irrigation during the day have been shown to provide a cooling effect within orchards which can limit fruit damage so the solar system will allow this to happen without the concern of incurring the associated electricity costs.

Water Saving Activity	Area ha	Water Saving (ML/ha)	Total Water Saving (ML)	Conservative Water Saving (ML)	Conservative Water Saving (ML/ha)
Soil Moisture Monitoring System	12.0	0.5	6.0		
		TOTAL	**6.0**	**3.4**	**0.28**

Project Budget:

Project costs have been based quotes provided [redacted].

Irrigation Design:

As the project is low volume/low complexity and involves no changes to the irrigation delivery and distribution system no design has been supplied consistent with program guidelines.

[redacted]

1 PROJECT DETAILS:

CID Name:	[redacted]	**Date:**	24/09/2020
CID No:	[redacted]	**Client Name:**	[redacted]
Project Name:	[redacted]	**Project No:**	[redacted]
Submitted By:	[redacted]	**Contractors:**	[redacted]

2 PREAMBLE AND PROJECT SCOPE:

The above project was assessed on the below mentioned scope and is limited to project data supplied, including any documentation and designs as being true and correct in every respect.

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:

a) 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;
b) the rationale for the water savings assessment is clearly explained;
c) the projected water savings can be achieved while maintaining the agricultural production potential of the Property on which the Works would be completed as part of a Project;
d) the engineering solutions they entail are achievable and appropriate to the needs of the Eligible Irrigator and the Property;
e) the projected costs are reasonable and realistic, and within the expected range for that type of infrastructure and scale of installation; and
f) the projected water savings they will generate represent the conservative or minimum feasible volume that could be derived from completing the Works.

[redacted]

[redacted]
Certified Irrigation Designer

[redacted]