Government of South Australia
Department for Environment and Water

SOUTH AUSTRALIA - ADDITIONAL EFFICIENCY MEASURES CRITERIA ASSESSMENT OUTCOME

Project Reference No:	325939
Outcome:	Compliant with the Efficiency Measures assessment
Date recommended to proceed to public comment	15 September 2020
Date recommended to proceed to the Australian Government's detailed assessment stage	19 March 2021

Overview

The project involves the fitting of a variable speed drive to the pump motor, new primary and secondary filtration, new mainline, sub-mains and valves and the replacement of existing under-tree and under-vine sprinklers with surface drip irrigation on a 20.37ha wine grape and citrus property located near Renmark in the SA Riverland region.

The conversion from the existing under-tree sprinklers to surface drip irrigation is the primary water savings activity within the project however this will be supported by further integrated irrigation system modernisation as described.

The works are projected to increase the annual turnover of the enterprise by approximately 20% largely driven by yield increases. The increased farm output will also increase seasonal employment requirements and support existing employment along the fruit picking, packing, processing and distribution supply chains.

Water savings in addition to the volume nominated for transfer will be generated through the project works which will assist the business to be adapted to reducing and fluctuating water availability. As the works will reduce the annual irrigation requirements of the property the additional retained savings will assist with creating additional supply within the consumptive pool.

The property is located within the Renmark Irrigation Trust (RIT) network which is firmly committed to the sustainable management of land and water resources. RIT's commitment to this cause was recognised through being the first agricultural site and first irrigation water provider in the world to be awarded gold level certification by the Alliance for Water Stewardship. This project is consistent with RIT's longer term environmental objectives by facilitating best practice on-farm water management practices.

A conservative water saving of 16.3ML or 0.8ML/ha is nominated for the proposal.

Part 1 - State Assessment - Efficiency Measures criteria

Assessment Approach

This 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 primary water saving component for the project is the proposed conversion of 6.56ha of under-tree sprinkler and 13.81ha of under-vine sprinkler irrigation with surface drip irrigation. The upgrades to the pump (VSD), primary & secondary filtration, mainline, sub-mains, valves and the automation and control system is expected to deliver significant water use and general operational efficiencies across the property.

Consistent with published benchmarks for these types of modernisation activities, conservative water savings of 2.0ML/ha and 1.5ML/ha are expected to be achieved from the under-tree and under-vine sprinkler to surface drip irrigation conversions respectively noting that these figures represent the lower end of the water savings range for these types of conversions. The additional integrated upgrades to the mainline, sub-mains, valves and irrigation control system will ensure there is a very high likelihood of achieving the nominated water savings.

The project is expected to return a conservative 16.3 ML to the environment, with the applicant retaining 17.5 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)
Under-Tree Sprinkler – Surface Drip (Citrus)	6.56	2.0	13.1	**16.3**
Under-Vine Sprinkler – Surface Drip (Wine Grapes)	13.81	1.5	20.7	
Total Water Saving			**33.8**	

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 responses 5b and 6b. 6a. Please refer to the attached Renmark Irrigation Trust – Information Statement. 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 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, 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 - Renmark Irrigation Trust, is involved in or aware of the project.
Potential Direct Water Market Impacts (Criteria 7a, 7b, 7c, 7d)	7a. Please refer to the attached Renmark Irrigation Trust – Information Statement 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. • The water entitlements to be transferred have been held for a minimum of 3 years at the time of

	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. Please refer to the attached Renmark Irrigation Trust – Information Statement that verifies that the nominated water entitlements meet the 3-year ownership requirement. 7c. The project will have no direct impact on the reliability of water either individually or cumulatively when considered with other projects. The volume of water being transferred is minimal (16.3ML) and is more than offset by the expected savings (33.8ML). The water that is currently held by the proponent is committed to on-farm production due to the crops grown being permanent plantings and therefore no negative impact on water reliability is expected as a result of implementing the project. 7d. As described above in 7c. this project will generate a net increase in water supply based on pre project water demand vs. post project water demand. The proponent also holds sufficient entitlement to meet annual irrigation		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 will put downward pressure on water market prices.

	demand and an increased 'buffer' (held entitlement:demand) will be generated as a result of the project. This is a common scenario for all permanent horticulture projects and therefore the project is not expected to directly increase the price of water.		
Contribution to Proponent Businesses and Irrigation District Viability (Criteria 4a, 4b, 4c)	4a. As was outlined in 2a. the property where works are proposed is 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 application 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. Both the winegrape and citrus industries make important contributions at a State and National scale so the benefits extend broadly. 4b. The property where the project works are proposed is located within the Renmark Irrigation Trust which has been fully piped since 1975 and services over 600 irrigators. The works are focused on on-farm upgrades and will have no impact on existing supply infrastructure. 4c. As described in 2a. the Renmark Irrigation Trust has a long history of adopting and	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 and winegrape production in the SA Riverland. • The project will contribute to the longer term viability of the properties which will provide benefits across the irrigation district and the trust more broadly which is consistent with current business plans.

	enabling best practice irrigation management. This project is consistent with that and also well aligned with regional land and water management plans and strategies.		
Support for Regional Economies (Criteria 5a, 5b, 5c, 5d, 6c)	5a. All irrigation components will be sourced from suppliers based in the local Renmark community which will ensure the program investment remains in the local community and provides economic stimulus. The works will also ensure the property continues to support seasonal employment engaged in fruit picking, packing, processing and distribution activities. 5b. Currently the property is not operating as efficiently as it could be and these works will address the current limitations with irrigation management. The benefits of improving the productivity of on-farm water use extend beyond the farm gate and provide flow-on benefits to the local community, region and the State. 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 property is 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 held delivery shares within RIT will occur as a result of the project. 5d. As has been outlined in other criteria the	Y	The application has demonstrated that the project will: • Support the citrus and winegrape industries which are important sectors of the Riverland and SA State economy. • Contribute to the Renmark Irrigation Trust's longer term environmental objectives by facilitating best practice on-farm water management practices. • Lead to an increase in 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 just the applicant through 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.

	proposals will not impact negatively on regional jobs and existing seasonal employment demands are expected to increase as a result of the project which will improve fruit production. All project related works will be undertaken by local businesses which contribute localised economic stimulus. 6c. While this project will deliver significant positive benefits to the proponent these benefits will extend beyond the farm gate through investment in the local community both for the project works and in the longer term. The project will also generate retained 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. This project is consistent with best practice irrigation management and is seeking to	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 ML for the business and region. o Improving the business's 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.

	upgrade an old and inefficient sprinkler irrigation to a modern, surface drip irrigation system. 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 directly from local and regional based businesses which will mean the economic stimulus generated by the project will remain in the local community. The works will also ensure the property remains sustainable and profitable into the future and continues to support seasonal employment and indirect employment along the fruit picking, packing, processing and distribution chains. 2b. As this project is focused on on-farm works it is not expected to directly contribute to amenity values within the local community. 2c. N/A		o 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 to local communities of weirs, storages and parks. Accordingly, 2b is not applicable. The project is below the $4 million threshold for large projects and is not required to address criteria 2c.
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	Y	The application has demonstrated that the applicant and delivery partner have an understanding of all relevant legislation 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.

	being paid.		
Business Resilience, including Drought and Climate Change Impacts (Criteria 10a, 13a, 12a)	10a. Please refer to response to 5b. 13a. The project will address existing inefficiencies in on-farm irrigation management. The works will reduce annual irrigation demand and also generate additional supply through the retained savings that will remain with the proponent. This will mean post project that the proponent is much better adapted to future climate variability which is expected to increase the volatility of water supply. 12a. As described in 7a. the project proposal has been individually assessed and this assessment confirms that a conservative volume of the total saving is nominated for return. The project works budget has also been substantiated through formal quotations.	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 and winegrape 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. • Contribute to the Renmark Irrigation Trust's longer term environmental objectives by facilitating best practice on-farm water management practices.
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	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.

	members and this project will invest in ensuring the longer term viability of a members enterprise. The RIT has been working in partnership with the Commonwealth Environmental Water 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. 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 on-going seasonal 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
Any project that decreases the total pool available to food production results in negative outcomes as there will simply be less water available for agriculture. 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.	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, proponents of all on farm projects in South Australia under the efficiency measures program have retained a portion (ranging from 12 percent to 89 percent) of the water savings with this 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.
On-farm efficiency measures are creating upward pressure on water prices as reported in independent research completed by ABARES and Aither and do not meet principle 7d – Projects must not directly increase the price of water.	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

Independent research over a number of years, most recently from the University of Adelaide, has demonstrated that irrigators who participate in on-farm projects are highly likely to purchase additional water following the implementation of the project and the resulting increase in enterprise profitability.	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.

The application does not provide details of how it will impact the irrigation network, nor does it provide details of the local and regional plans for the area and how the project aligns with relevant objectives.	These criteria have been addressed in various places in the application and the proponent has demonstrated that their proposed project will: • Increase productivity in terms of return per ML for the business and region. • Improve the business's long term resilience and viability which will have flow on benefits to the local, regional and State economies. • Source 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 application has also provided evidence that the relevant network operator is involved in or aware of the project.

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:** 21/7/20

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

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

Submitted by: [redacted] **Irrigation Design 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 replace the existing under canopy irrigation system with new drip irrigation comprising new mainline, submains, flushing submains, dripline, valves, filtration and automation. Also an upgrade to existing pump by adding VFD. Total project area 20.4Ha.*

   b. *The projected water savings of 16.3ML (0.8ML/ha) from the irrigation upgrades are considered conservative and suitable for the wine grape and citrus 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 installation of the new drip 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 168ML (184.3 RIT class 3 entitlement -16.3ML offer) will be retained by the grower for production. This available volume is sufficient to meet full water requirements of the currently planted 13.81Ha of wine grapes and 5.6 Ha of Citrus of approx. 146ML*

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

   a. *The new drip irrigation system is achievable and appropriate to meet the needs of the irrigator and improve irrigation efficiency. The design work was completed by* [redacted]*. This company will also supply all the necessary components to complete the project.* [redacted] *will carry out the major irrigation system installation work.*

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 the new drip irrigation system.*

Signed as the Independent Approved Irrigation Professional for this Project

[redacted]

Name

Signature

21/7/20

Date

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

Project ID: [redacted]

Crop Type: Wine Grapes & Citrus

Project Summary:

The applicant is seeking to modernise the irrigation system on an existing 20.4ha wine grape and citrus property located near [redacted] in the SA Riverland region. The works will include fitting a variable speed drive to the pump motor, new primary and secondary filtration, new mainline, sub-mains and valves and the replacement of existing under-tree and under-vine sprinklers with surface drip irrigation.

A new fertigation and control system will also be installed and flushing manifolds will be installed to the wine grape irrigation valves. An upgrade to the drainage pump which is connected into the Renmark Irrigation Trust drainage network will also be completed.

A conservative water saving of 16.3ML, or 0.80ML/ha is nominated for the proposal.

Water Saving Methodology:

The primary water saving component for the project is the proposed conversion of 6.56ha of under-tree sprinkler and 13.81ha of under-vine sprinkler irrigation with surface drip irrigation. As described above integrated upgrades to the pump (VSD), primary & secondary filtration, mainline, sub-mains, valves and the automation and control system is expected to deliver significant water use and general operational efficiencies across the property.

Consistent with published benchmarks (*refer OFIEP R4 Fact Sheet & Crop Water Use by System Type – SA Riverland*) for these types of modernisation activities, conservative water savings of 2.0ML/ha and 1.5ML/ha are expected to be achieved from the under-tree and under-vine sprinkler to surface drip irrigation conversions respectively noting that these figures represent the lower end of the water savings range for these types of conversions. The additional integrated upgrades to the mainline, sub-mains, valves and irrigation control system will ensure there is a very high likelihood of achieving the nominated water savings.

Note 5.87ha of the property is currently vacant and therefore the water savings have been calculated based on only the current irrigation footprint (20.37ha).

Water Saving Activity	Area (ha)	Nominated Water Saving (ML/ha)	Total Water Saving (ML)	Conservative Water Saving (ML)	Conservative Water Saving (ML/ha)
Under-Tree Sprinkler – Surface Drip (Citrus)	6.56	2.0	13.1		
Under-Vine Sprinkler – Surface Drip (Wine Grapes)	13.81	1.5	20.7		
		TOTAL	**33.8**	**16.3**	**0.80**

Project Budget:

Project costs have been based quotes provided [redacted].

Irrigation Design:

An Irrigation Design has been completed by a certified designer for the irrigation system and a copy is included as an attachment to the application.

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.

The specific irrigation efficiency improvements will contribute to reducing deep drainage beyond the crop root zone and hence improved salinity outcomes for the River Murray.