Government of South Australia
Department for Environment and Water

SOUTH AUSTRALIA - ADDITIONAL EFFICIENCY MEASURES CRITERIA ASSESSMENT OUTCOME

Project Reference No:	Reference No 953607
Outcome:	Compliant with the Efficiency Measures assessment
Date recommended to proceed to public comment granted	15 September 2020
Date recommended to proceed to the Australian Government's detailed assessment stage	18 December 2020

Overview

This project involves the modernisation of an existing under tree sprinkler irrigation system to surface drip irrigation on an 8.0ha citrus property located at Winkie in the SA Riverland.

The primary water savings activity will be the conversion of existing under-tree sprinklers to surface drip irrigation with integrated upgrades to the pump, including variable speed drive technology, new primary filtration and new mainline, sub-mains and valves. An upgrade of the properties automation and control system will also occur as part of the project. Water savings are based on industry crop water use benchmarks for the respective irrigation system types.

The works are expected to significantly improve the productivity of the property through the increased yields and the quality of fruit produced. This will result in increased annual turnover and hence improve the overall profitability of the business. This will mean secure existing levels of seasonal employment both on-farm and along the fruit packing and distribution supply chain.

The works will also generate water savings in addition to the volume that is nominated for transfer to the Australian Government and the retained savings will assist the business to be better adapted to periods of reduced water availability. The retained savings will also increase the overall supply of water available within the consumptive pool which will provide benefits beyond the farm gate.

The works will facilitate best practice irrigation management and minimise drainage beyond the crop root zone which can have an adverse impact on surrounding wetlands, floodplains and the River Murray. All project works will occur within the existing irrigation footprint of the property meaning there will be no impact, or disturbance on native vegetation and other important ecological assets. Given the region's strong reliance on tourism and River Murray based recreation to drive the economy these are important outcomes of the project.

A conservative water saving of 5.0ML of 0.63ML/ha is proposed for the project.

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.

Currently the orchard is irrigated with a fixed speed irrigation pump and old and under-performing under-tree sprinkler irrigation. The system will be replaced with a new 18.5kW pump and motor fitted with a variable speed drive delivering water through upgraded primary filtration and via new mainline, sub-mains and surface drip irrigation. A new irrigation controller will also be installed as part of the project.

Consistent with the standard benchmarks for this type of irrigation modernisation based on citrus crop water requirements a water saving of up to 2.0ML/ha can be expected to be achieved through the upgrades.

The project is expected to return a conservative 5 ML to the environment, with the applicant retaining 11 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 Upgrade (Citrus)	8.0	2.0	16.0	**5.0**
Total Water Saving			**16.0**	

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 5b. 6a. Please refer to attached Central Irrigation Trust Water Rights 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 within the SA MDB region.	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 - Central Irrigation Trust, is involved in or aware of the project.

	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.		
Potential Direct Water Market Impacts (Criteria 7a, 7b, 7c, 7d)	7a. Please refer to attachment Central Irrigation Trust Water Rights Summary 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 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. Central Irrigation Trust Water Rights Summary verifies that the nominated water entitlements meet the 3 year ownership requirement. 7c. The project works result in a significant	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 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.

	reduction in annual irrigation demand (16ML) but the proponent is only seeking to return a conservative volume (5ML) of the assessed saving 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 and together with the small volume returned will not directly increase the price of water.		
Contribution to Proponent Businesses and Irrigation District Viability (Criteria 4a, 4b, 4c)	4a. As addressed in Criteria 2a.the property where the works are proposed is located within the Berri Irrigation Trust in the SA Riverland. The existing irrigation system is old and inefficient and the project will modernise the on-farm infrastructure. The works will result in a significant increase in production (t/ha) which will have flow-on benefits to the local and broader Riverland community. 4b. The property is located in the Berri Irrigation Trust and is serviced by the water delivery systems provided by the trust. There is a high density of properties in the area that are all serviced by the Berri Irrigation Trust and therefore the infrastructure will remain a critical component of the trust operations into the future. 4c. As described in criteria 4b. the property is located within the footprint of the Berri	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 properties which will provide benefits across the irrigation district and the trust more broadly which is consistent with current business plans.

	Irrigation Trust. The trust is responsible for the delivery of significant volumes of irrigation water to customers within this footprint. Improvements in on-farm irrigation efficiency assist the trust to manage drainage which has benefits at a whole of trust level.		
Support for Regional Economies (Criteria 5a, 5b, 5c, 5d, 6c)	5a. As described in Criteria 2a. all works associated with the project will be undertaken by local contractors meaning the investment will remain in the local community and region. The works will increase productivity of the orchard which will have positive outcomes on seasonal employment and along the supply chain e.g. packing sheds and distribution. 5b. Currently on-farm water use is limited by the inefficient irrigation system which by extension impacts on the volume and quality of fruit that is produced. It is anticipated that these works will significantly increase the productivity (t/ML) and profitability ($/ML) of on-farm water use. Projections suggest a significant increase in yield (t/ha) will be achieved and a higher percentage of fruit will reach premium quality brackets meaning profitability will significantly increase. 5c. As has mentioned in responses to previous criteria the property is located within the Berri Irrigation Trust and the works are focused on investing in the property to ensure it is sustainable and viable in the longer term. The project does not involve any reduction in held delivery shares within the trust and therefore these fixed charges will continue to be met by the project proponent.	Y	The application has demonstrated that the project will: • Support the citrus industry which is an important sector of the Riverland and SA State economy. • Increase water use efficiency in ways that align with current strategic plans developed by Citrus Australia for the ongoing prosperity of growers maximising returns, developing markets, protection of production through biosecurity, using resources responsibility and respecting the environment. • 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.

	5d. It is expected that the works will generate additional seasonal employment due to the increased production that will occur at the property. The increased production will also ensure higher volumes of product are delivered to local packing sheds which will assist with securing employment in these sectors of the supply chain. 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 deliver a significant volume of 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. While this project is relatively small in scale (8ha) it is expected to dramatically increase the efficiency and productivity of water use on the property. Currently the citrus orchard is irrigated with an aging and inefficient under-tree sprinkler irrigation so the modernisation works will set the property up for the future. All works that will be undertaken will be completed by contractors based in the local community meaning the investment will provide direct stimulus to the local economy. The improved productivity will ensure increase volume of product for local packing sheds which will assist with under-pinning existing employment along the supply chain.	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 ML 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

	The property is also located within the Berri Irrigation Trust so the modernisation of the property will ensure it remains viable and productive into the future which will in turn have flow on benefits to the broader irrigation trust area. 2b. This project involves on-farm works and not the upgrade of shared amenity sites as referenced in this criteria. 2c. N/A.		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 being paid.	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.
Business Resilience, including Drought and Climate Change Impacts (Criteria 10a, 13a, 12a)	10a. Please refer to response to 5b. 13a. As has been described in previous criteria the project is projected to generate significant water savings of which only approximately 32% is nominated for return. This will leave retained savings that will assist the proponent to better manage climate variability especially where this results in reductions in water availability in dry seasons. Additionally when allocations are high the proponent will have surplus water that can be made available on the seasonal allocation market which will provide an additional	Y	The application has demonstrated that the project will: • Increase water use efficiency in ways that address strategic plans developed by Citrus Australia for the ongoing prosperity of growers maximising returns, developing markets, protection of production through biosecurity, using resources responsibility and respecting the environment. • Address under-performing irrigation areas which will allow water to be used as efficiently as possible while maximising output (yield).

	revenue stream and broader flow-on benefits with respect to water supply in the sMDB. The redevelopment of the two properties to drought and salinity tolerant rootstocks will also ensure the properties are better protected and adapted to periods of severe water shortages such as those experienced during the Millennium drought and which potentially will be more common in the future given the prolonged periods of reduced inflows into the MDB. 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.		• 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.
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 irrigated agriculture sector. 8b. The project will engage local contractors to deliver all works which will provide a direct economic stimulus within the local community. It is these same local agricultural service businesses that in turn support local community and sporting organisations via sponsorship.	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.

	The Riverland region and the small towns within the region are very reliant on a sustainable irrigation industry to drive the local economy. Improvements in water management also help to assist to deliver flow-on benefits to local and regional environmental assets such as the River Murray and wetlands and floodplains. Tourism is a key industry sector in the Riverland region and therefore investing in projects that minimise the impacts of irrigation on tourism assets and attractions assists this vitally important sector also. Water that is recovered through projects is able to be strategically deployed to priority environmental assets which provides benefits for all water users and the community, region and State more generally. 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
While the amount of water to be recovered is relatively small, it is the cumulative impact of additional water recoveries that amount to significant third party impacts. 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 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

Relevant Public Comments to be responded to	Response to Relevant Public Comments
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.	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.

[redacted]

1 PROJECT DETAILS:

CID Name:	[redacted]	**Date:**	21/05/2020
CID No:	ADM 2570	**Client Name:**	[redacted]
Project Name:	[redacted]	**Project No:**	4
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]

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

Project ID: [redacted]

Crop Type: Citrus

Project Summary:

The applicant is seeking to replace an aging under-tree sprinkler irrigation system on an 8.0ha citrus property located near [redacted] in the SA Riverland irrigation area.

The irrigation system modernisation will include pump and primary filtration upgrade, new mainline, sub-mains and automation.

A conservative water saving of 5.0ML or 0.63ML/ha is nominated for the proposal.

Water Saving Methodology:

Currently the orchard is irrigated with a fixed speed irrigation pump and old and under-performing under-tree sprinkler irrigation. The system will be replaced with a new 18.5kW pump and motor fitted with a variable speed drive delivering water through upgraded primary filtration and via new mainline, sub-mains and surface drip irrigation. A new irrigation controller will also be installed as part of the project.

Consistent with the standard benchmarks (Refer: *OFIEP Round Four Fact Sheet & Crop Water Use by System Type – Riverland SA*) for this type of irrigation modernisation based on citrus crop water requirements a water saving of up to 2.0ML/ha can be expected to be achieved through the upgrades.

As a 4.8ha area of the existing plantings will be re-developed at the same time (privately funded) the installation of the variable speed drive will ensure that the varying irrigation requirements of the established orchard and the young trees can be accurately delivered.

Water Saving Activity	Area (ha)	Water Saving (ML/ha)	Potential Water Saving (ML)	Conservative Water Saving (ML)	Conservative Water Saving (ML/ha)
Under-Tree Sprinkler – Surface Drip Upgrade (Citrus)	8.0	2.0	16.0	5.0	0.63

Project Budget:

Project costs have been based on quotes provided [redacted]

Irrigation Design:

An Irrigation Design has been completed for the irrigation system and a copy has been included as an attachment to the proposal.

[redacted]

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.