Government of South Australia
Department for Environment and Water

SOUTH AUSTRALIA - ADDITIONAL EFFICIENCY MEASURES CRITERIA ASSESSMENT OUTCOME

Project Reference No:	34765
Outcome:	Compliant with the Efficiency Measures assessment
Date recommended to proceed to public comment	31 March 2020
Date recommended to proceed to the Australian Government's detailed assessment stage	20 May 2020

Overview

The project involves installing permanent netting structures over 33.0 hectares (ha) of citrus plantings located at Lyrup in the SA Riverland irrigation region.

Previous applied studies have demonstrated significant water efficiencies can be achieved with the adoption of permanent netting over horticultural crops. The primary driver of the water savings is driven by the reduction in evapotranspiration levels under netting which is predominantly the result of significantly reduced wind runs under netted crops and this also has flow on benefits to fruit quality and hence profitability. The netting can also assist with crop establishment meaning commercially viable production is achieved earlier.

Studies also show that fruit quality is significantly improved under netting with a much higher percentage of fruit produced in higher grade specifications. These works are projected to increase annual turnover in the netted area by approximately 20% which coupled with the water use reductions delivers a much improved productivity of on-farm water use. The netting also protects the crops from extreme weather events such as hail and intense rainfall which can potentially result in complete crop loss. While these events are not common they can cause lasting financial pressures on impacted enterprises.

The works will also assist to secure existing full time and seasonal employment both directly (on-farm picking) and along the fruit packing and distribution supply chain.

The property is located adjacent to wetland, floodplain and riverine environments of high ecological value and the project works will ensure any irrigation induced impacts on these assets are minimised.

A conservative water return of 104.3 megalitres (ML) to the environment is expected to be generated through the project works.

Part 1 - State Assessment - Efficiency Measures criteria

The South Australian Government assessment against the Efficiency Measures -Agreed Criteria for this application was undertaken prior to the development of this template. Accordingly, the original assessment is provided at Attachment A.

Part 2 - State Response – Public Comments

Relevant Public Comments to be responded to:	**Response to Relevant Public Comments**
1. The proposal does not address how the project will address all of the socio-economic criteria required. Many of the answers in the project proposal are 'N/A' or are vague statements that provide no evidence that there will be no socio-economic impacts as a result of the project either locally or further afield eg criteria 6c response does not address the question and also states that there will be a positive impact on water entitlements as a result of the project (which is the opposite to other investigations' findings).	There are specific criteria that are not the responsibility of project proponents to respond to or address e.g. 1, 2(e) and 3. There are also criteria that do not apply to this project proposal as it does not exceed the agreed $3 million threshold for a large project e.g. 2(c) and 8(c). Additionally criterion 6(a) does not apply to this project as the applicant is not located within an irrigation network and is a private diverter. In regard to criterion 6(c), the project application has detailed that there are likely to be socio-economic benefits associated with the project for broader regions. The proponent is retaining an estimated 60 ML of water saved from this project which will reduce the applicant's need to buy water on the temporary allocation market. This in turn reduces demand on the water market which will result in some downward pressure on prices.
2. There are many other answers to the socioeconomic criteria that are insufficient in detail or evidence. Negative impact questions were ignored, and this is not an acceptable response, particularly in light of the recently released draft independent socio-economic impact report. https://www.basin-socio-economic.com.au/draft-report-submission	The negative impact questions have not been answered as the applicant is only required to include information about mitigation or enhancement if there have been negative socio-economic impacts identified. For this application no negative socio-economic impacts were identified.
3. This project will reduce the water in the consumptive pool and, as the MDB	Buybacks and efficiency measures are often conflated, especially when it comes

Independent Socio-economic (Sefton) report states, this has negatively impacted on other regions and industries (page 3).	to the negative impacts of water buybacks to industries and communities. The South Australian Government has been very clear that efficiency measures are the preferred method of recovering 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. This project will generate water savings above the volume returned to the Commonwealth and is increasing the water available for productive uses in the consumptive pool. Water saved as a result of the project that is in addition to that returned to the Commonwealth is retained by the applicant and can be traded on the water market, or used to manage water availability in dry years. Consequently, this project will put downward pressure on water market prices.
4. The submission quotes research that they say proves netting generates water savings of up to 5 ML/ha (along with a lot of other private benefits not related to water savings), but the reference to the actual research source is not provided. It is critical that this reference is provided as the savings appear to be significant, and the mechanisms as to how the water savings are generated needs to be explained and understood. The level of detail here is very scant, vague and unrelated to water savings. The water savings also seem somewhat high in relation to overall citrus use of 13 ML/ ha (~40%). Only research on the issue that we found was a study on the SA Murray-Darling Basin website of a trial in the SA Riverland which did quote around a 4 ML/ha difference on an open surface (not crop) but concluded that it was too difficult to come to a conclusive answer because of differences between the irrigation methods used on the control and the netted crop. (Link below) https://www.naturalresources.sa.gov.au/samurraydarlingbasin/land-and-farming/sustainable-irrigation/sustainable-irrigation-resources	The water savings proposed to be generated by the project have been assessed by an Independent Approved Irrigation Professional as being reasonable and realistic. Please refer to information regarding the Water Savings Substantiation included in Attachment A. The 104.3 ML proposed to be returned to the Commonwealth through the project has been assessed as the conservative or minimum water savings that would be derived through completion of the works. It is estimated there will be additional water saved as a result of the project and that will be retained by the applicant. Crop netting is an approved activity under the Efficiency Measures Program.
5. This project does not appear to meet the purpose of the program ie genuine water savings produced with no adverse impacts on the MDB. Funding netting, that has very high private benefits that are not related to the WUE program goals, would not be good value for money. There is no comment about cost	Crop netting is an approved activity under the Water Efficiency Program. The funding applied for is within the Program limit of 1.75 times the current market value of the water rights transferred to the Australian Government.

sharing. The project seems to be a straight buy back of water, with additional funding for agriculture redevelopment also provided by the government.	
6. Criteria 5a answer seems to imply that irrigation holdings will be expanded as a result of the project. The WUE program cannot fund projects that expand the irrigation footprint, is this project eligible?	The project application does not include information that suggests the proponent intends to increase the area of land currently irrigated.
7. Criteria 6b does not address the criteria's requirement: ie that regional industry has been consulted about the project. No evidence that this has occurred in proposal.	The response to criterion 9(a) provides further details about consultation undertaken: "*The delivery partner and proponent have consulted the state peak body Citrus Australia South Australia (CASA) along with local government, relevant regional bodies and key stakeholders. The proposal also aligns 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*."
8. There is no evidence provided by the proponent that there would be no cumulative impact from further water transfers as a result of this project (criteria 7c). Simply a statement that says the water is class 3, but no reason provided as to why transferring this standard SA irrigation water entitlement is not impacted by cumulative effects.	The application has been assessed as having no direct impact on the reliability or price of water as the applicant will retain any water saved as a result of the project above that returned to the Commonwealth. This will result in additional water being available in the broader consumptive pool due to reduced demand by the applicant.

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.

Government of South Australia
Department for Environment and Water

Attachment A -

Water Efficiency Program – South Australian Government assessment of application against Efficiency Measures – Agreed Criteria

Application # 34765

Overview

The applicant is seeking to install permanent netting over 33 hectares of citrus located at Lyrup in the SA Riverland. The permanent netting is expected to generate water savings and significant fruit quality improvements contributing to the overall profitability and sustainability of the enterprise.

The application demonstrates that the project will result in genuine water savings, increased productivity and gross turnover, maintain or increase local employment and have no negative third party impacts on irrigation systems, water markets or regional communities as the applicant will retain additional water savings.

Total volume of Eligible Water Rights offered for transfer – 104.3 ML

Water Savings Substantiation Undertaken by an Independent Approved Irrigation Professional

From a water use efficiency perspective, permanent netting has been shown to significantly reduce the rate of evapotranspiration which has a direct relationship to irrigation requirements. The key driver of the reduction in evapotranspiration is the effect the permanent netting has on reducing wind speeds inside the netted areas compared to the observations taken outside of the nets. Netting also provides protection against heavy rainfall and hail which can potentially wipe out entire crops at a major economic cost.

Water Saving Component	Area ha	Water Saving (ML/ha)	Estimated Water Saving (ML)	Total volume of Eligible Water Rights offered for transfer (ML)
Installation of Permanent Netting	33.0	3-5	165.0	104.3
Total Water Saving			**165.0**	**104.3**

Assessment Approach

This assessment is reliant on the information provided by the applicant. The comments provided in Table 1 against each criteria are a summary of the information provided by the applicant which was deemed relevant by the assessor to demonstrate that the Efficiency Measures – Agreed Criteria have been met.

Assessment Outcome

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 public comment stage.

Table 1- Assessment of application against Efficiency Measures – Agreed Criteria

Assessment Criteria	How to assess compliance	Complete Y/N	Comments
1. **Projects must be made public**	• The Australian Government is responsible for mapping projects, releasing technical reports and advertising. This will be completed following in-principle or formal approval from states and DAWE.	N/A	

Assessment Criteria	How to assess compliance	Complete Y/N	Comments
2. **Projects do not negatively impact on social and environmental outcomes**	• Does the application describe the expected socio-economic and environmental outcomes of the proposed project including: o the anticipated socio-economic impacts to the local community, region or state; o the project's strategy for increasing the socio-economic benefit to participants and their communities (e.g. local sourcing of goods, services and labour); and o if and how the project will contribute to regional investment and development in the geographic area. • Does the application identify the relevant laws (including environmental laws and regulations and work health and safety laws): o that will require approval prior to works commencing; and o that will need to be complied with during the project.	Y	• The permanent netting is expected to generate water savings and significant fruit quality improvements, contributing to the overall profitability and sustainability of the enterprise. • Producers with netting are able to consistently achieve higher-class pack-outs which improves the marketability of the fruit and the profitability of the business. • The application has identified that the project is estimated to: o Increase yield by 5 tonnes/ha o Increase gross annual turnover from growing irrigated crops in the areas covered by the works by $825,000 o Save 165ML per annum through reduced evaporation/transpiration and transfer 104.3ML to the Commonwealth, effectively increasing the water available for production by 60.7ML • Total cost is below $4 million so criterion 2(C) is not applicable. • The application describes all works will be carried out by a local South Australian company and the work crews will use local accommodation. Extra local staff will support these crews during the erection phase which will deliver further economic stimulus to the region and build skills and local capacity. • The Delivery Partner and applicant share a strong safety ethos across their respective business areas and comply with all regulations and laws to maintain a healthy and safe environment. • An application has been lodged for council building consent approval for the project.

Assessment Criteria	How to assess compliance	Complete Y/N	Comments
3. **The project assessment for funding must be clear, timely, simple and transparent, and not unduly increase red tape**	• States and Commonwealth to review and assess applications in accordance with agreed process.	N/A	
4. **Projects need to demonstrate how they contribute to the current and future viability of proponent businesses and irrigation districts**	• Does the application describe how the project will contribute to the current and future financial viability of the irrigation district/region where it will occur, including identification of potential irrigation network improvements? • Does the project avoid upgrading water supply infrastructure where the system, or parts of the system, are not going to be used in the future? • Where the proposed project is located within an irrigation trust does it take account of relevant irrigation business' strategies or plans?	Y	• The project will deliver increased productivity in terms of returns per ML to the enterprise, increased yield and increased gross turnover of $825,000. • Through reducing the impacts of temperature and improving water use efficiency, the works will improve the business' resilience to future climate change and drought, therefore improving its future viability. • The property is not part of an irrigation trust network however the works will ensure the family owned and operated enterprise can continue to grow and prosper which will have flow on benefits to the local community and Riverland region more generally.
5. Programs or projects support regional economies	• Does the project: ○ identify opportunities to support local industry and regional development ○ focus on increasing water use efficiency in ways that address industry, network/ system and local/ regional priorities, future needs and risks and may include research and extension services ○ demonstrate how the project will help maintain regional productivity and employment.	Y	• The project will increase productivity in terms of return per ML and provide the enterprise with longer term resilience and viability. • The project will assist in providing a high quality supply of fruit to local pack houses which supply the Australian market and export to over 20 countries. • This will assist the citrus industry to retain a critical mass which will contribute to industry support programs such as local research, development, extension and adoption activities. • The proposal will also lead to an increase in seasonal employment during the harvest period along with engaging local contractors during the redevelopment and construction phase.

Assessment Criteria	How to assess compliance	Complete Y/N	Comments
6. Programs or projects do not have negative third-party impacts on the irrigation system, water markets or regional communities	• Where a proposed project is located within an irrigation network, does the application provide evidence that the relevant network operator or water corporation is involved in or aware of the project?	Y	• The property is not part of an irrigation trust network; however, the project will ensure the future viability, sustainability and adaptability of the business. • The Citrus industry is a critical sector of the Riverland ensuring the on-going sustainability and profitability of the industry has major flow on benefits to local towns, the Riverland region, the State and the nation. • The project will assist the citrus industry to retain a critical mass which will contribute to industry support programs such as local research, development, extension and adoption activities.
7. Projects need to be assessed for their potential to impact on the price of water	• Does the application include an assessment conducted by an Independent Approved Irrigation Professional and/or Approved Agricultural Economist certifying that the proposed Works are technically and practically feasible, will generate the conservative or minimum technically feasible water savings and are economically viable? • Does the application provide evidence that the water rights proposed to be transferred are owned by the proponent at the time of their application and have been held for a minimum of 3 years at the time of application? • Does the application describe the potential impacts of the proposal on the reliability of water or the price of water?	Y	• The water savings proposed to be generated by the project have been assessed by an Independent Approved Irrigation Professional as being reasonable and realistic. • The application demonstrates that the water entitlement to be returned has been held for over 3 years. • The proposed project is not anticipated to have a negative impact on the price of water. • The applicant will retain water savings above that returned to the Commonwealth which will result in additional water being available in the broader consumptive pool due to reduced demand by the applicant.

Assessment Criteria	How to assess compliance	Complete Y/N	Comments
8. Any cultural impacts identified, protected or improved	• Does the application describe any potential cultural impacts of the proposed project to the local community, region or state? • Does the application identify opportunities to increase the cultural benefit to participants and their communities (e.g. local sourcing of goods, services and labour)? • For projects over $3 million does the application identify any cultural heritage sites and describe how any impacts will be managed in accordance with relevant Commonwealth and State laws?	Y	• The project is expected to underpin existing businesses which provide flow on benefits to the local community and the Riverland region more generally. • Goods and services for the project will be sourced from a SA based company and the proposed works will enhance the resilience and adaptability of the participating business. • The water returned through the project will also provide opportunities to contribute to localised ecological outcomes on the Pike River Floodplain which is a high priority ecological and cultural area.
9. Program design should include close engagement with community and industry leaders	• Does the application describe the consultation that has/will be undertaken as part of the project with a focus on increasing water use efficiency in ways that address industry, network/system and local/regional priorities, future needs and risks?	Y	• The delivery partner and proponent have consulted the state peak body Citrus Australia South Australia along with local government, relevant regional bodies and key stakeholders. • The proposal aligns 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. • Through the consultation process the proponent has identified specialised citrus varieties that will be analysed for profitability and production to help future market development and promotion of the industry.
10. Where practical, seek to develop and implement integrated implementation of efficiency measures to maximise benefits to the irrigation network and local enterprises	• Does the application focus on increasing water use efficiency in ways that address industry, network/system and local/regional priorities, future needs and risks and may include research and extension services. This would include integrated proposals?	Y	• This has been addressed in the comments on criteria 5 and 9.

Assessment Criteria	How to assess compliance	Complete Y/N	Comments
11. Monitoring and evaluation, including of socio-economic outcomes, should be built into programs and used to regularly review and adapt programs, as required	• Does the application identify the monitoring and reporting measures relating to the anticipated outcomes of proposed projects?	Y	• The project will be subjected to the Monitoring, Evaluation, Reporting and Improvement Plan adopted for the Water Efficiency Program.
12. Projects must deliver real water savings and not result in profiteering or rorting	• Will the project allow the participant to individually profit without creating water savings?	Y	• The estimated water savings for this proposal have been prepared using industry accepted benchmarks for the works proposed and have been reviewed and endorsed by an Independent Approved Irrigation Professional.
13. Proposals should identify improved capacity to respond to changes in business environment including drought and climate resilience	• Does the application provide information on how the project will improve resilience to climate variability?	Y	• The application describes the expected productivity improvements for the enterprise which will increase its ability to endure and adapt to future climate variability and water availability. • Through reducing the impacts of temperature and improving water use efficiency, the works will improve the business' resilience to future climate change and drought, therefore improving its future viability. • The project will also provide protection to the orchard against extreme climatic events such as heavy rainfall and hail which can potentially wipe out entire crops at a major economic cost. • The proposed project aligns with the following Citrus Australia policy priorities: o Recognise the citrus industry as an efficient user of water with a light environmental footprint. o Support for increased government grants and R&D into adaptation, biosecurity and value chain strategies that address climate variability, improve energy efficiency and reduce direct emissions.

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

Project ID: [redacted]

Crop Type: Citrus

Project Summary:

The applicant is seeking to install permanent netting over 33ha of citrus located at [redacted] in the SA Riverland. The permanent netting is expected to generate water savings and significant fruit quality improvements contributing to the overall profitability and sustainability of the enterprise.

A conservative water saving of 104.3ML is nominated for the proposal.

Water Saving Methodology:

Anecdotally the water savings generated by permanent netting have been understood to be in the order of 30% however significant applied research has been undertaken in recent years to more closely quantify the benefits of the installation of permanent netting over horticultural crops including citrus.

From a water use efficiency perspective permanent netting has been shown to significantly reduce the rate of evapotranspiration which has a direct relationship to irrigation requirements. The key driver of the reduction in evapotranspiration is the effect the permanent netting has on reducing wind speeds inside the netted areas compared to the observations taken outside of the nets. Netting also provides protection against heavy rainfall and hail which can potentially wipe out entire crops at major economic cost.

The table below shows the measured evapotranspiration levels at a citrus orchard located at Pyap (SA) for netted vs. un-netted patches over the past 3 irrigation seasons. As shown in the table there is a consistent reduction in the measured evapotranspiration rate ranging from a low of 333.7mm to a high of 663.0mm with an average reduction over the 3 year period of 512.2mm which equates to 5.12ML/ha.

	Evapotranspiration (mm)			
	2018-19	**2017-18**	**2016-17**	**3 Year Mean**
Netted	1063.8	1044.5	1008.4	1038.9
Un-Netted	1603.6	1378.2	1671.4	1551.1
Difference	539.8	333.7	663.0	512.2
% ETo Reduction	34%	24%	40%	33%

Source: https://www.awsnetwork.com.au/

Based on the measured evapotranspiration data presented in the table above the theoretical irrigation requirements for mature citrus trees (crop coefficient – 0.84) would range from 11.6ML/ha to 14.0ML/Ha (excluding effective rainfall). Therefore applying a water saving of 30% would deliver water savings in the order of 3.5ML/ha to 4.2ML/ha.

In addition to the improved water use efficiency permanent netting has also been shown to significantly increase fruit quality which contributes to increased profitability.

[redacted]

Water Saving Activity	Area ha	Water Saving (ML/ha)	Total Water Saving (ML)	Conservative Saving (ML)
Installation of Permanent Netting	33.0	3.0ML/ha - 5.0ML/ha	165.0	**104.3ML**
Total Water Saving	**33.0**		**165.0ML**	**104.3ML**

Based on the above a conservative water saving of 104.3ML is nominated for this proposal which is at the lower end of the potential water saving for the adoption of permanent netting.

Project Budget:

Project costs have been based on quotes provided by [redacted].

Irrigation Design:

Designs of the permanent netting have been completed and are included as attachments to the application.

Approvals/Environmental:

Council Approval is required to conduct the works as the works 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.

[redacted]

1 PROJECT DETAILS:

CID Name:	[redacted]	**Date:**	10/02/2020
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]