Member of the Surbana Jurong Group

Memorandum

To	Dylan McWhinney, Goulburn Murray Water	**Date**	12/04/2022
From	Paula Saad, Louise Bochner	**No of Pages**	1 of 9
Reference	30042570 – Sunday Creek Reconfiguration Project		
Subject	Socio-Economic Impact Assessment Review		

1 Introduction

The proposed Sunday Creek Reconfiguration Project (the Project) aims to deliver water directly to Sunday Creek from the Murray River, creating a more water efficient and cost-effective irrigation supply to the Sunday Creek Irrigation Syndicate. In addition, the Project allows the hydraulic diversity of the Lake Moodemere wetland complex to be improved resulting in a more natural wetting and drying cycle at the site.

The scope aims to facilitate government approval of the proposed Project works, which include:

- A new purpose built 36ML/day electric pump station to extract water from the Murray River;
- A direct pipeline to transfer water from the pump station to Sunday Creek, enabling Lake Moodemere and its fringing marshes to be bypassed;
- A new embankment at Hells Gate, allowing Sunday Creek and Lake Moodemere to be operated independently of each other; and
- Decommissioning the old pump station and upgrading the existing Lake Moodemere regulator on the River Murray in line with modern safety standards and facilitate the ongoing management of water levels in the lake.

The current reliance on Lake Moodemere for the storage and transfer of irrigation water supports a range of recreational values that may otherwise not be possible. Thus, maintaining these values has been a fundamental consideration in the Project's planning.

1.1 Purpose of this memorandum

The purpose of this memorandum is to undertake a review of the impacts identified in the Socio-Economic Impact Assessment (SEIA) Report prepared by Jacobs in 2020. The review will be based on the new data provided in the updated water modelling regarding water savings and anticipated changes to Lake Moodemere health.

This memorandum will be an addendum to the SEIA and will outline the updated data and any changes associated with the environmental, social and economic impacts previously identified and that relates with the topics of water savings and changes to Lake Moodemere health.

1.2 The need for updated modelling

High quality hydrological modelling and ecological data is required to support the environmental and planning approvals documentation for the Project. The primary objectives of updated water modelling are:

- To confirm the new hydrological operating regime of Sunday Creek, Lake Moodemere and the Northern Marshes post construction;
- Building on the extensive existing documentation and producing updated documents of to support planning permits and referrals of the Project in accordance with Commonwealth and State legislation; and
- To inform a draft Water Management Plan to be presented to relevant stakeholders.

1.3 The need for a Socio-Economic Impact Assessment review

The water levels and water savings data provided in the modelling are used as an evidence-based approach to inform environmental, social and economic impacts that may occur as a result of the Project.

The ability to bypass Lake Moodemere will significantly reduce water losses and improve reliability and efficiency of supply for irrigators. The new water regime will also result in restoration of a more natural wetting and drying cycle for Lake Moodemere between the months of February to August each year.

A review of the SEIA was therefore required to align the extent of the impacts already identified with the new data provided by Jacobs (2020) in the updated water modelling.

2 Modelling update

SMEC has undertaken a review of the water modelling, which provides updated data regarding water levels and the proposed operating rules.

Updated proposed operating rules

A preliminary set of operating rules were set out by Jacobs in 2019, building on past water modelling work and consultation with community and agency stakeholders regarding the future management of lake levels. The water modelling has since been updated by SMEC in 2022. Taking into consideration the new data provided by the updated modelling, the key elements of the planned operating rules, following construction of the new pump and pipeline, include the following:

- During the irrigation season, Sunday Creek will be maintained between a maximum and minimum operating level of 128.7m and 128.9m AHD respectively. At these levels the creek holds 10.1ML of water (GHD, 2010) which acts as a supply buffer to each of the irrigators in the syndicate;
- To ensure there is enough water in Lake Moodemere to run the annual rowing regatta, and for other recreation purposes, water levels in Lake Moodemere are required to be at a minimum level of 128.7m AHD from the beginning of January each year. This should be achieved from opening the Lake Moodemere Regulator and filling from the Murray River. Where this arrangement drops below 128.7m AHD, the regulator should be closed, and the new pump station operation should be changed to allow filling of the lake from Sunday Creek via the proposed Hells Gate regulator as needed to achieve the 128.7m AHD level; and
- From January each year, the Lake Moodemere regulator should be closed, and the lake should be allowed to drawdown. The pump station should only supply the irrigators in Sunday Creek with no water pumped into the lake.

Water savings and lake health update

While the updated water modelling provides new data regarding the water levels, water savings are consistent with Jacobs' findings (2020). Therefore, for the purpose of this review we anticipate that the data utilised by the Jacobs to prepare the SEIA is still the latest and most up to dated. The estimated water savings as a result of the Project are summarised in Table 1 below.

Table 1 Modelled water losses and potential savings (DEPI, 2014)

Site	Losses under current operation (ML)	Losses under proposed operation (ML)	Savings (ML)
Lake evaporation	485	465	20
Sunday Creek evaporation	123	75	49
Marsh evapotranspiration	705	246	459
Marsh seepage	94	28	66
Total	**1407**	**814**	**594**

3 Socio-Economic Impact Assessment

The Project will result in a range of environmental, social and economic positive and negative impacts.

The following sections provide a more detailed description of the environmental impacts related to water savings and changes to Lake Moodemere health and a summary of all socio-economic impacts that are likely to occur as a result of the Project, as identified in the SEIA prepared by Jacobs (2020).

3.1 Environmental impacts

Overall, there are expected to be significant net benefits to the environment by reinstating the hydraulic diversity of the site. In addition to the direct and immediate ecological benefits, the Project provides the opportunity for targeted environmental management of the site (Jacobs 2020).

Water Savings

The Sunday Creek Reconfiguration Project generates water savings through more efficient supply of irrigation water. The estimated water savings as a result of the Project are summarised in the previous session (Table 1 above), and outline the following:

- The bulk of water savings are generated by reduction in undesirable flooding within the Northern Marshes; and
- Minimal evaporative savings are made in Lake Moodemere once the need to maintain water levels for the rowing regatta are provided for (Jacobs 2020).

Anticipated changes to the health of the Lake Moodemere complex

As per the current operating rules, the proposed alteration in the Lake Moodemere will generally see a gradual decrease in lake levels following the initial fill in January. Habitat diversity within the Lake Moodemere complex is increased when water levels are lower and a mix of deep water, shallow water and mudflat habitats are present simultaneously. According to the Sunday Creek Reconfiguration Project (SCRP) Detailed Flora and Fauna Assessment (SMEC 2022), five migratory/marine species have previous records within the study area and/or have suitable habitat within the broader area (DEWLP 2022a). Depending on water levels within Lake

Moodemere and the Northern Marshes habitat may be present to support these species. It is likely that a more natural hydrological regime (i.e. wetting and drying cycles) will result in an increase in foraging habitat for migratory and marine species.

Project works are unlikely to detrimentally impact migratory/marine species due to the distance of impact areas from suitable foraging habitat.

Summary of environmental impacts

A summary of anticipated environmental impacts, identified in the SEIA prepared by Jacobs (2020), as a result of the Project is summarised in Table 2 below.

Please refer to the SCRP Detailed Flora and Fauna Assessment (SMEC 2022), for further identified ecology impacts.

Table 2 Summary of environmental impacts

System component	Potential benefits	Potential risks	Net impact
Lake Moodemere wetland complex	• Reinstatement of a more natural watering regime within the Northern Marshes • Greater diversity of vegetation communities in Lake Moodemere and the northern marshes • Improved habitat for native fish, particularly important fish species such as Southern Pygmy Perch and Flat-headed Galaxias not currently found in the complex • Regeneration of threatened and less represented vegetation types currently present but not prevalent, including River Swamp Wallaby-grass • Greater availability of frog habitat with an expected increase in frog diversity and abundance • An increase in the diversity of waterbirds present, driven by an improvement in the availability of feeding habitat for wading waterbirds and mudflat specialists • Improved condition of fish due to increased food availability because of increased variability in water height	• Increase in the extent and quantity of Giant Rush beds at the expense of other habitats • Localised reduction in the quantity of suitable habitat for certain threatened vertebrates (Fly Specked Hardyhead, Murray River Turtle and Broad-shelled Turtle) • Construction of the Hells Gate regulator will cause separation between Lake Moodemere and Sunday Creek fragmenting these two waterbodies. • Colonisation by invasive plant species within areas of wetting and drying habitats • Exotic fish may benefit from the drawdown as they are generally more tolerant of warmer water and poor water quality, particularly carp, gold fish and eastern gambusia	Positive

System component	Potential benefits	Potential risks	Net impact
Sunday Creek	• Reduced hypoxia events, and overall improved water quality. In-turn this is likely to increase native diversity of fish and other aquatic vertebrates • Decrease populations of noxious fish species such as carp which tolerate poorer conditions, while increasing the abundance of native species • Opportunities for re-introduction of native fish species such as freshwater catfish which prefer more stable habitat	• Loss of thermal refuge, assuming that Sunday Creek offers some protection from cold water present in the Murray River • Disconnection of Sunday Creek via the concrete sill at Hells Gate increases fragmentation of the wetland complex • Some additional siltation of Sunday Creek may occur under the new arrangement, although is expected to be minor	Neutral to positive

3.2 Social impacts

The Project is expected to deliver net benefits to existing and new recreational users of Lake Moodemere. The only exception may be water skiers who may need to ski in alternative nearby locations when the water level at Lake Moodemere is too low. The Project also provides opportunities to celebrate and share the site's rich cultural Aboriginal history and to facilitate the local Aboriginal Community Yorta Yorta's involvement in the ongoing management and rehabilitation of the site (Jacobs 2020).

Table 3 below summarises the main passive and active recreation uses of the lake and how these would be impacted by the Project, as outlined in Jacobs SEIA (2020).

Table 3 summary of social impacts

System component	Potential benefits	Potential risks	Net impact
Passive recreation			
Picnicking	• Provision for additional picnic facilities (refer to Section 3.1.4 of the SEIA) • Provision for a potential interactive information hub to enhance user experience • Amenity of healthier ecosystems/ biodiversity to enjoy • Lower noise disturbance if there are less water skiers on the lake	• A small number of people may prefer to have more consistent views of higher water levels all year round	Positive
Bird watching	• Increased biodiversity and bird activity for current visitors	• No potential risks envisaged	Positive

System component	Potential benefits	Potential risks	Net impact
	• Will be recognised as a bird watching location and attract new visitors		
Active recreation			
Bushwalking / cycling	• Provision for additional break spots/ points of interest along the way including picnic facilities and interactive information hub (refer to Section 3.1.4 of the SEIA) • More variability in views throughout the year • Amenity of healthier ecosystems/ biodiversity to visibly enjoy • Increased amenity and reduced noise impacts if there are less water skiers on the lake	• Some people may prefer to have more consistent views of higher water levels year-round	Positive
Swimmers	• Increased amenity if there are less water skiers on the lake when levels are lower • May have more access to shallower lake levels	• Lake levels at times may be less conducive to swimming	Neutral
Fishing	• Provision of all-abilities platform for fishing • Increased amenity if there are less water skiers on the lake when levels are lower	• Growth of vegetation along the lake banks may reduce the extent of open areas for shoreline anglers	Neutral
Rowing/ kayaking	• Increased amenity if there is less water skiers on the lake when levels are lower	• There may be some months where lake levels are lower and less attractive to rowers/kayakers • Higher lake levels for the regatta should mitigate most if not all of these impacts during peak rowing/kayaking periods	Neutral
Water skiers	• No potential benefits envisaged	• There may be some months where lake levels are lower and less attractive for water skiers. Higher lake levels for the regatta during the peak usage period (January), will mitigate some of these impacts	Neutral to negative

System component	Potential benefits	Potential risks	Net impact
		• The lake levels may impact the timing and location of the Slalom Classic	
Camping	• Reduced noise from diesel pumps • More nature-based activities for campers to enjoy • Reduced noise from water skiers	• Some people may prefer to have more consistent views of higher water levels all year-round	Positive
Events (e.g. regatta)	• None – the lake levels are to be maintained for the rowing regatta event	• None – the lake levels are to be maintained for this event to continue as planned	Neutral
Education / excursions	• Improving the natural environment combined with plans for information hubs that support interaction and appreciation of the environment, history and culture, will provide an improved experience for outdoor education. This will benefit student groups and nature-based tourism groups	• No potential risks envisaged	Positive
Safety impacts			
Safety	• Decommissioning of existing Moodemere Pump Station will mitigate the risk of the bank collapsing and the pump station falling into the river (e.g. during a flood) • The replaced regulator will be built to current safety standards improving the safety for all visitors and operators	• No potential risks envisaged	Positive
Cultural Values			
Cultural	• Opportunity to celebrate Aboriginal history, connection to country and local culture • Opportunities for Aboriginal ongoing involvement in site management that protects and enhances cultural value and connection to country • Opportunity to enhance species of cultural significance Please refer to the Draft Cultural	• None. However, plans to increase visitation at the site may impact remaining Aboriginal cultural heritage values. Please refer to the Draft Cultural Heritage Management Plan (Terraculture Heritage Consultants 2010) and Draft Cultural Heritage Management Plan (ACHM 2022) for further	Positive

System component	Potential benefits	Potential risks	Net impact
	Heritage Management Plan (Terraculture Heritage Consultants 2010) and Draft Cultural Heritage Management Plan (ACHM 2022) for further information on Cultural Heritage impacts.	information on Cultural Heritage impacts.	

3.3 Economic impacts

The Project will have a positive impact on the local irrigation sector and the businesses that are dependent on it, As identified in Jacobs' SEIA (2020) it is anticipated that there will be no adverse economic impacts.

The economic impacts considered includes:

- Direct impacts – these relate to impacts directly attributable to the change in the irrigation water supply system. These include benefits to irrigators from more efficient and reliable supply, as well as any disbenefits to irrigators; and
- Indirect impacts - these relate to any flow on effects impacts. This may include businesses that have a dependency on the irrigation sector, or the tourism sector which may be affected by changes to how the lake may be perceived or used.

A summary of the direct and indirect economic benefits as well as disbenefits, as identified by Jacobs (2020), is summarised in Table 4 and discussed in more detail below.

Table 4 Summary of economic impacts

System component	Potential benefits	Potential risks	Net impact
Direct impacts			
Irrigation sector productivity	• Reduced pumping costs • Reduced manual operation and maintenance (cost and time)	• Minor loss of water along Sunday Creek reducing total entitlements by approximately 3% per annum	Positive
Irrigation sector resilience	• Improved water reliability and greater business certainty to expand and/or diversify production	• No potential risks envisaged	Positive
Indirect impacts			
Businesses	• Strengthen tourism industry from nature based tourism and growth in wine cellar door activity • Some opportunities for businesses to establish around nature based tourism businesses	• Reduced consistency in view for waterfront businesses. There is only one business known to be affected and the owner is also part of Sunday Creek Irrigation Syndicate and supports the Project	Neutral to positive

	• Improved resilience of businesses dependent on irrigation sector		
Other irrigators/water market	• No potential benefits envisaged	• No potential risks envisaged	Neutral

4 Conclusion

The proposed Sunday Creek Reconfiguration Project delivers a more water efficient and cost-effective irrigation supply to the Sunday Creek Irrigation Syndicate, generating water savings from bypassing the Lake Moodemere and delivering water directly to Sunday Creek.

A SEIA Report, which identified a range of positive and negative environmental, social and economic impacts, was prepared by Jacobs in 2020. SMEC has undertaken a review of the water modelling, which provides updated data regarding water levels and the proposed operating rules. Therefore, a review of the impacts related to water savings and anticipated changes to Lake Moodemere health was required in order to align the extent of the impacts in the SEIA with the updated data.

It was concluded that the updated data in the water modelling does not affect the extent of impacts regarding water savings and changes on the lake health previously identified in the SEIA. This memorandum reinforces and summarises all environmental, social and economic impacts already identified in the SEIA.

In alignment with the SEIA prepared by Jacobs (2020), the Project is expected to deliver:

- Net benefits to irrigators through more efficient and reliable water supply;
- Net benefit to the regional economy that is dependent on agriculture, wine production and tourism;
- Net benefits to most affected recreational users of the lake and surrounds – including passive visitors (picnickers), birdwatchers, bushwalkers, cyclists, campers, and educational groups;
- Neutral impacts on swimmers, recreational anglers, rowers and kayakers. The proposed operating rules will allow the annual regatta to continue;
- Net benefits to the local environment by improving hydraulic diversity of the site;
- Improved community safety by removing or replacing assets that don't comply with safety standards; and
- Improved appreciation and connection to the site's cultural significance, its history and environmental value through interpretive information hub at key locations within the reserve.

Whilst there are some inconveniences to local water skiers, some of these are avoided by the operating rules introduced to support the local regatta and the social and economic value that it provides to the community. When the water levels are too low for water skiing there are local alternatives, including the Murray, Lake Hume, Lake Mulwala and Lake Buffalo. These alternatives have less restrictions in place for water skiing than Lake Moodemere. Overall, the Project is expected to deliver net environmental, social and economic benefits to the region (Jacobs 2020).

There are no management, mitigation and enhancement measures related to the environment, social and economic impacts identified at the SEIA prepared by Jacobs (2020). Such measures would help decrease the net impact of the potential risks and enhance the potential benefits.