RMCG

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Viewbank Solar Farm Agricultural Assessment

Final Report

ERM

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1 Introduction

1.1 PROPOSED DEVELOPMENT

A solar energy facility is proposed to be installed at 90 McCague Road, Girgarre East, in the Goulburn Valley region, as shown in Figure 1-1. The site consists of approximately 210 ha and backs onto the Midland Highway.

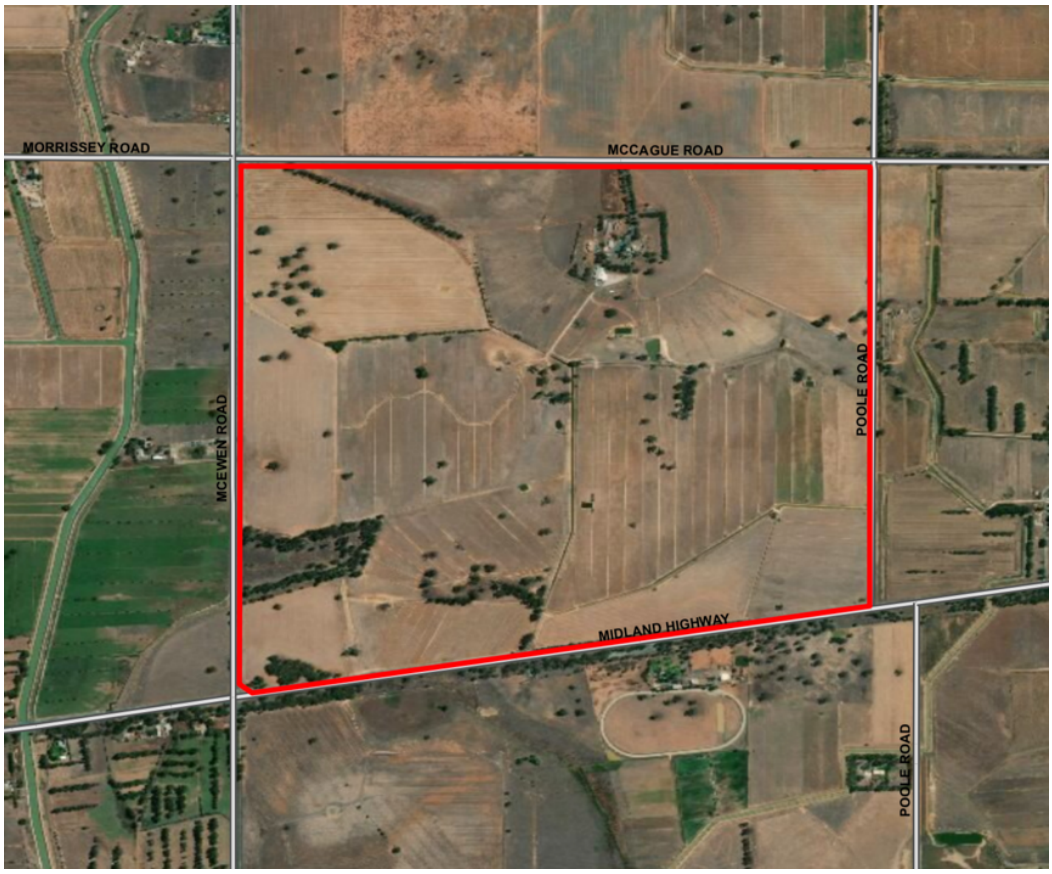


Figure 1-1: Location of proposed solar energy facility

The proposed development consists of a 75 MW (AC) solar farm, a 25 MW Battery Energy Storage System and associated equipment including a substation and operations building.

1.2 PURPOSE

The purpose of this agricultural value assessment is to determine the agricultural uses and value of the site, with regards to the *Solar Energy Facilities Design and Development Guidelines* (DELWP, 2019). This report will contribute to the planning application documentation for the proposed development of the site, as a solar energy facility.

The DELWP guidelines reference the importance of a site's land and economic attributes in determining strategically important agricultural land in Victoria. The DELWP guidelines also make specific reference to solar energy facilities that are located in irrigation districts. As this site is located within the Goulburn Murray Irrigation District (GMID), an assessment of the implications of this is provided in this report.

1.3 SCOPE

Our scope is limited to aspects of the proposed development relating to the agricultural value of the site. This assessment will include:

- Site features relevant to agricultural production, such as existing infrastructure, soil types, climate and water availability
- Surrounding land uses
- Irrigation infrastructure and the GMID
- Production levels
- Outline that available water limits agricultural production in the GMID
- Relative agricultural value to the region and state.

2 Development guidelines and policy

2.1 SOLAR ENERGY FACILITIES DESIGN AND DEVELOPMENT GUIDELINES

The guidelines which inform our assessment are the *Solar Energy Facilities Design and Development Guidelines* published by DELWP in August 2019 (subsequently referred to as the DELWP Guidelines).

As solar energy facilities are often located on or close to agricultural land, the DELWP Guidelines provide specific planning strategies for the protection of agricultural land. The key policy measures noted in the DELWP Guidelines are:

- *protecting strategically important agricultural and primary production land from incompatible land use*
- *protecting productive agricultural land that is of strategic significance to a local area or in a regional context*
- *avoiding the loss of productive agricultural land without considering the impact of the loss on the agricultural* sector and its consequential effect on other sectors.

The DELWP Guidelines also state that *"Renewable energy generation can and does coexist with agriculture production, which contributes to the rural economy and supports farm incomes by diversifying property owners' revenue streams".* In addition to other site considerations for solar energy facilities, the DELWP Guidelines propose that site selection should also consider:

- *the impact on the loss of the site if it has high-quality soils, particularly soils that are niche to a type of crop or other agricultural activity*
- *the potential loss of reliable, accessible water (such as irrigated areas) and its impact at a local or regional scale*
- *the impact of fragmentation and a change of land use to non-agriculture activity on local and regional productivity and output*
- *the impact of a change of land use on recent and/or current efforts to modernise and reform agricultural activity in the area*
- *whether the land has specifically been set aside or defined for agricultural use and development in a planning scheme or other strategic document*
- *whether the change in land use is to the detriment of a government's previous or existing investment and support for the site or the area*
- *whether the proposed solar energy facility can co-locate with other agricultural activity, to help diversify farm' income without reducing productivity*.

The DELWP Guidelines also provide direction in respect to solar energy facilities in irrigated districts. The DELWP Guidelines state that for sites located within irrigated districts, there should be consideration for:

- *alignment with local and state government irrigation infrastructure priorities, managed by rural water corporations*
- *the importance of primary irrigation infrastructure for current and future rural water corporation asset management planning and the viability of rural irrigation districts and communities*
- *the potential impacts of withdrawing sites from irrigated activity on future viability planning, where those sites are serviced by modernised irrigation infrastructure*
- *the ability of a site to revert back to irrigated activity in the future, and the ease with which it can do so*

As more solar energy facilities are being proposed and installed, particularly clustered in areas with existing electricity network infrastructure, the DELWP Guidelines also provide advice on managing the cumulative effects of multiple renewable energy facilities in the same area. In relation to agricultural impacts, the DELWP Guidelines state that this could "reduce the availability and/or productivity of strategic agricultural land, particularly in irrigation districts".

2.2 PLANNING POLICY

At a state level, farmland within irrigated areas is recognised as needing particular planning consideration. The Victorian Planning Provisions (VPPs) *Clause 14.02-3S Protection of Declared Irrigation Districts* sets out objectives and strategies to manage and protect irrigated areas. Key policies include the need to:

- Identify and plan for the future needs of communities to adapt and adjust to land use change in a declared irrigation district
- Protect agricultural land serve by modernised irrigation infrastructure, to ensure the future viability of a declared irrigation district
- Ensure non-agricultural land use does not undermine the integrity of the irrigation network and complements existing and future agricultural use and productivity
- Ensure land use change in a declared irrigation district does not negate the potential opportunities for a rural water corporation to make adjustments to the footprint of a declared irrigation district that are identified under an approved plan or strategy
- Ensure land use change does not limit the ability of future investment in irrigation infrastructure to realise the intended benefits of minimising water loss, improving irrigation service efficiency to the farm gate and increasing overall agricultural productivity.

At a local level, within the Greater Shepparton Planning Scheme, clause 21.02 – Key Influences and Issues states that '*Land use planning control needs to protect the main production irrigated areas to secure their future for farming but also integrate with the planed modernisation and reconfiguration of the systems and potential expansion into the agricultural development area.*'

2.3 OTHER SOLAR ENERGY FACILITIES WITHIN THE REGION

A number of large scale solar energy facilities have been proposed in Victoria in recent years. Due to either the number of objections received or unfavourable council decisions, these proposals have been referred to VCAT or Planning Panels Victoria for a decision on their application.

We reviewed the findings of proposed solar energy facilities within the Goulburn Valley area. These referrals found that the proposals did not represent a loss of significant agricultural land, nor affect the ability to continue farming on neighbouring agricultural land. A summary of these applications and the findings relating to the agricultural impacts of the proposed facilities follows.

PROPOSED SOLAR ENERGY FACILITY, LIGHTSOURCE RENEWABLES, NARING, MOIRA SHIRE

In April 2018 the Moira Shire Council decided in favour of a planning permit application by Lightsource Renewables for the construction of a solar energy facility at Naring, 10 km east of Numurkah in the Moira Shire. The site consists of approximately 125 ha of agricultural land used to grow barley and sits within the Moira Shire Planning Scheme farming zone.

Daryl Poole of RMCG completed an assessment of the agricultural value of the proposed site for the VCAT hearing.

Two Applications for Review were submitted to VCAT and the hearing was conducted in November and December 2018. Following the hearing, VCAT granted the planning permit application, finding that:

- *Having regard to the generally benign nature of the proposed use, the proposal is unlikely to adversely impact on the capacity of surrounding agricultural land to continue to be used for that purpose.*
- *It is of some relevance that the proposal will not permanently or irretrievably remove the site from agricultural production. Upon decommissioning of the use, the site is capable of being restored to agricultural use.*

GREATER SHEPPARTON SOLAR ENERGY FACILITY PLANNING PERMIT APPLICATIONS

In November 2017, the City of Greater Shepparton resolved not to decide on the planning permits for four proposed solar energy facilities, located at Tatura East, Tallygaroopna, Lemnos and Congupna. In early 2018, the Victoria Planning Minister appointed a Panel to consider the applications. All four sites were in the Greater Shepparton Planning Scheme farming zone.

For each application, the Panel considered the application details, applicable planning policies, objections, potential impacts and evidence presented. With regards to the agricultural value and impacts of each site, the Panel considered:

- The suitability of the farming zone for solar energy facilities
- The compatibility of the proposed facilities with adjoining and nearby land uses
- The capability of the sites for the proposed use
- Impacts to soil quality, agricultural production and permanent removal of land from agricultural production
- Capacity to sustain agricultural use.

In July 2018 the Panel recommended that the Minister for Planning issue all four planning permits, with conditions. The Panel included the following findings with regards to agriculture in its report:

> *The Panel finds that the four proposed solar facilities can achieve State, regional and local planning policies on agriculture and renewable energy. The use of the subject land areas for solar energy facilities is consistent with priority agricultural land-use in State planning policy and uses in the Farming Zone. Using and developing the subject sites for solar energy facilities can, subject to appropriate permit conditions, harmoniously achieve agricultural production and renewable energy outcomes. The four proposed solar energy facilities, individually and cumulatively, will not remove agricultural land to the extent that would conflict with State or local planning policy.*
>
> *Any temperature increase within 30 metres will be negligible, however, any photovoltaic array should be separated by this distance from any neighbouring property boundary. Accordingly, neighbouring residences, orchards, horticulture, farming for cattle and livestock, and inspect population numbers will not be impacted by the solar energy facilities.*
>
> *The Farming Zone is appropriate for the four solar energy facilities. The facilities are of a scale which cannot be accommodated in existing industrial zoned areas. They will not adversely impact surrounding existing and future farm operations, or the broader Irrigation District. The soil types on the subject land are lower quality than other parts of the Irrigation District with higher value agricultural production.*

SUMMARY OF PROPOSED FACILITIES

There are a number of solar energy facilities that have been proposed within a farming zone and have been referred to VCAT or a Planning Panel. We have reviewed the findings of these referrals, which found that the proposals did not represent a loss of significant agricultural land, nor affect the ability to continue farming on neighbouring agricultural land.

3 Site and context analysis

3.1 SITE DETAILS

The site consists of approximately 217 ha, located within the Farming Zone (FZ) in the Greater Shepparton City Council planning scheme. The 217 ha is broken up into approximately:

- 98 ha of irrigation
- 106 ha of dryland area
- 13 ha non productive (laneways, house and machinery area, swamp).

The breakdown of the property areas is show in Figure 3-1.

Figure 3-1: Site area breakdown

The site is currently operated as a mixed farming enterprise consisting of grazing (prime lambs) and cropping.

3.2 SITE FEATURES

INFRASTRUCTURE

The infrastructure on the site includes:

- House and outbuildings
- Sheds
- Sheep yards
- Fencing

Figure 3-2: View from machinery sheds looking southward towards the irrigation area

IRRIGATION INFRASTRUCTURE

The farm is located in the Goulburn Murray Irrigation District (GMID) and is connected to a modernised backbone channel. The location of the GMID irrigation supply channel and service point is outlined in Figure 3-3. The irrigation system is border check irrigation delivered to the bays via open channels.

There is only one irrigation service point connecting the property to the irrigation network. This is located on the eastern boundary of the property. The GMID delivery channel is located outside the boundary of the site. Due to this, there will be no impact on GMID irrigation infrastructure from the installation of the solar farm on this site.

Connection to the GMID is via a pipe that then connects into an GMID open channel. The current owner has indicated, that the flow rate able to be achieved from the GMID service point is currently limited to 14 ML/day. Flow rates of 20 ML/day are considered to be more ideal, as they promote more efficient irrigation delivery.

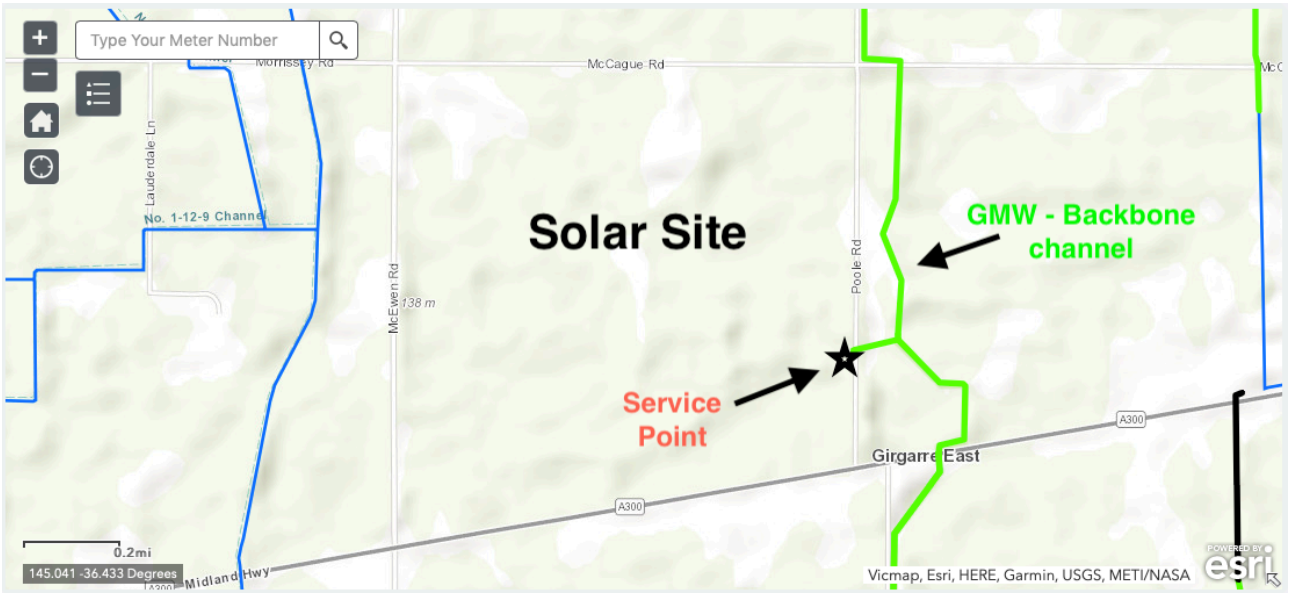


Figure 3-3: GMID irrigation connection point

Figure 3-4: GMW service point

Figure 3-5: Main on farm supply channel

The irrigation infrastructure on the property is highly variable and ranges from poor to moderate. There are a range of different bay outlets including:

- 1200 mm padman stops (four only)
- Over bank siphons
- 300 mm slide doors
- 250 mm pipes
- Shovel cuts

Figure 3-6: Examples of bay outlets on farm channels

A large section of the irrigation area (40%, 39 ha of a total of 98 ha) in the middle of the property is characterised by very long bays (up to 690 m) that are relatively flat. These characteristics would restrict their capacity to achieve good water use efficiency. The current owner has indicated that the start-up irrigation takes up to 15 to 18 hours to water one bay, when more ideal watering times would be 4 to 6 hours.

The water environment has changed significantly over the past 10 to 15 years with reduced water availability resulting in a subsequent increase in water price. Irrigation farms have needed to increase their water efficiency by improving on farm irrigation infrastructure, striving for improved flow rates onto paddocks through larger channels and bay outlets. This increases the ability of farms to grow more from less water, to remain competitive for water. Overall, for the farm to remain financially viable, farm infrastructure would need to be upgraded so that water use efficiency was improved.

SOIL

The site has a broad mixture of soil types, as documented in the 'Soils and Land Use in Part of the Goulburn Valle, Victoria' (Department of Agriculture, 1962) and accessed via Agriculture Victoria's Victorian Resources Online[1]. The soil map from this resource has been reproduced over an aerial photograph of the site and is provided in Appendix 1. The soil types on the site include:

- Group II: Shepparton fine sandy loam
- Group III: Lemnos loam and Erwen loam, normal phase
- Group IV: Goulburn clay loam, Goulburn loam and Type E
- Group V: Congupna clay loam
- Group VI: soils of prior stream beds-Type 2.

The distribution and agricultural capacity of the soils will be further outlined in Section 4.2 of this report.

[1] www.vro.agriculture.vic.gov.au

TOPOGRAPHY

The property is characterised by an elevated area (small hill) in the north of the site, where the farm house and sheds are located. The property then slopes down towards the irrigation areas that have been developed for border check irrigation.

DRAINAGE

There is a natural drainage line that transects the property, from the eastern boundary to the western boundary, which has been incorporated into the irrigation drainage system on the farm. Surface drainage water prior to exiting the site on the western boundary, moves through a swap area near the south west corner of the property. There is also another drainage discharge point located on the southern boundary, towards the south west corner of the site.

The water that can be seen in Figure 3-7 is runoff from a recent storm event that occurred just prior to the site inspection.

Figure 3-7: Swamp area at the drainage discharge point on western boundary of the property

CLIMATE

Data from the Bureau of Meteorology, Kyabram Station (number 080091) was used to gather climate statistics, as shown in Table 3-1.

Table 3-1: Climate data

PARAMETER	VALUE
Rainfall	Mean = 447 mm/annum 10th percentile = 286 mm/annum 90th percentile = 614 mm/annum
Temperature	Mean maximum = 21.8°C Mean minimum = 8.6°C

The average rainfall is sufficient for dryland agriculture, such as winter season cereal crops, but is insufficient for high value enterprises like dairy, summer cropping or horticulture, unless there is access to irrigation.

SURFACE AND GROUNDWATER

No surface waters (e.g. creeks, rivers) are located on the property.

Based on data available from Visualising Victoria's Groundwater[2] the depth to groundwater is between 5m and 10m, with a salinity between 7,000 and 13,000 mg/L total dissolved solids (TDS). This places the groundwater in beneficial use category E to F. The property does not have groundwater access.

The development of the solar facility on this site will not negatively impact the surface or groundwater in this area.

3.3 SURROUNDING AREA

LAND USES

The property is located in the GMID and the properties immediately surrounding the site are being used for a range of agricultural activities. This includes dairy and mixed farming enterprises. There are no horticultural enterprises in the immediate vicinity of the site.

There will no implications on the agricultural activities of the neighbouring properties if the site was to be developed as a solar facility.

[2] www.vvg.org.au

4 Analysis

4.1 INTRODUCTION

To understand the relative agronomic importance of the site in a local, regional and state context, an investigation of the agricultural attributed of this farm was completed. The DELWP Guidelines reference the importance of a site's land and economic attributes in determining strategically important agricultural land. The DELWP Guidelines also make specific reference to solar energy facilities that are located in irrigation districts. As this site is located within the GMID, an assessment of the implications to the irrigation scheme is also covered in this section.

4.2 AGRICULTURAL CAPABILITY

SOILS

Soil classification is useful in understanding the range of crops that will thrive at this site. Although topsoils can be improved or modified to some extent, the soil classifications are an inherent characteristic of the site. Therefore, the agricultural capability of the site is predominantly determined by soil type and group classification. The soil types at the site were identified in Section 3.2. An extract of the soil map is provided in Figure 4-1.

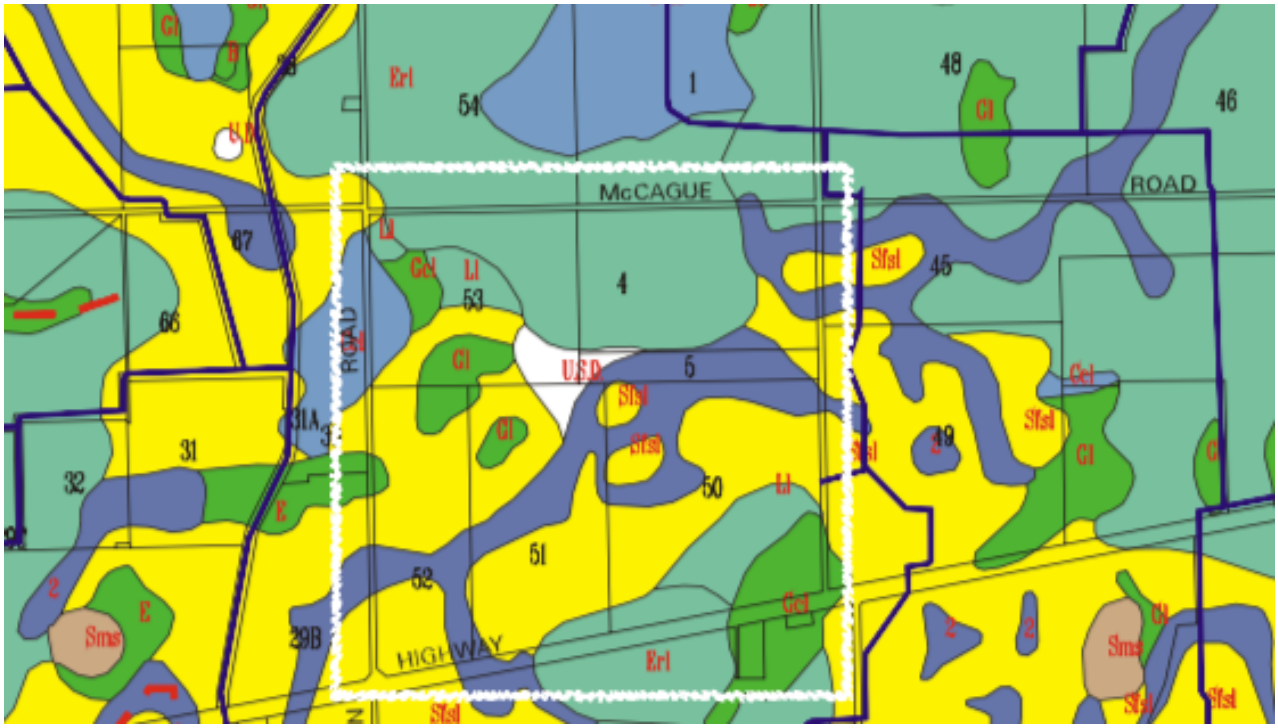


Figure 4-1: Extract of soil map (Department of Agriculture, 1962) accessed via www.vro.agriculture.vic.gov.au

The site can be described as having approximately:

- 40% Group II soils (Shepparton fine sandy loam)
- 30% Group III soils (Lemnos loam, Erwen loam normal phase)
- 20% Group VI soils 9 (Soils of prior stream beds Type 2)
- 10% Group V soils and unidentified soil (Congupna clay loam, Goulburn clay loam)

While 40% of the area is classified as Group II soils (Goulburn Valley Area -Legend to soils and crop suitability grouping[3]) which are excellent soils and suitable for horticultural cops (except citrus), cereals, lucerne, perennial and annual pastures, its distribution across the site is not uniform and in fact is more like a patchwork (see Figure 4-1). This makes it impractical to fully utilise these soils for the crops most suited to this high-quality soil type. For example, it would not be practical to implement permanent horticultural crops, as only parts of the paddocks are suitable for such crops.

However, the major limitation to being able to fully utilise the group II soils for horticulture, is the risk of inundation. The Group II soils are located directly beside the area identified as subject to inundation (see Figure 4-2). Permanent horticulture is highly susceptible to inundation. Therefore, the close proximity of the Group II soils to that area, would be too great a risk to consider this type of high value agricultural activity.

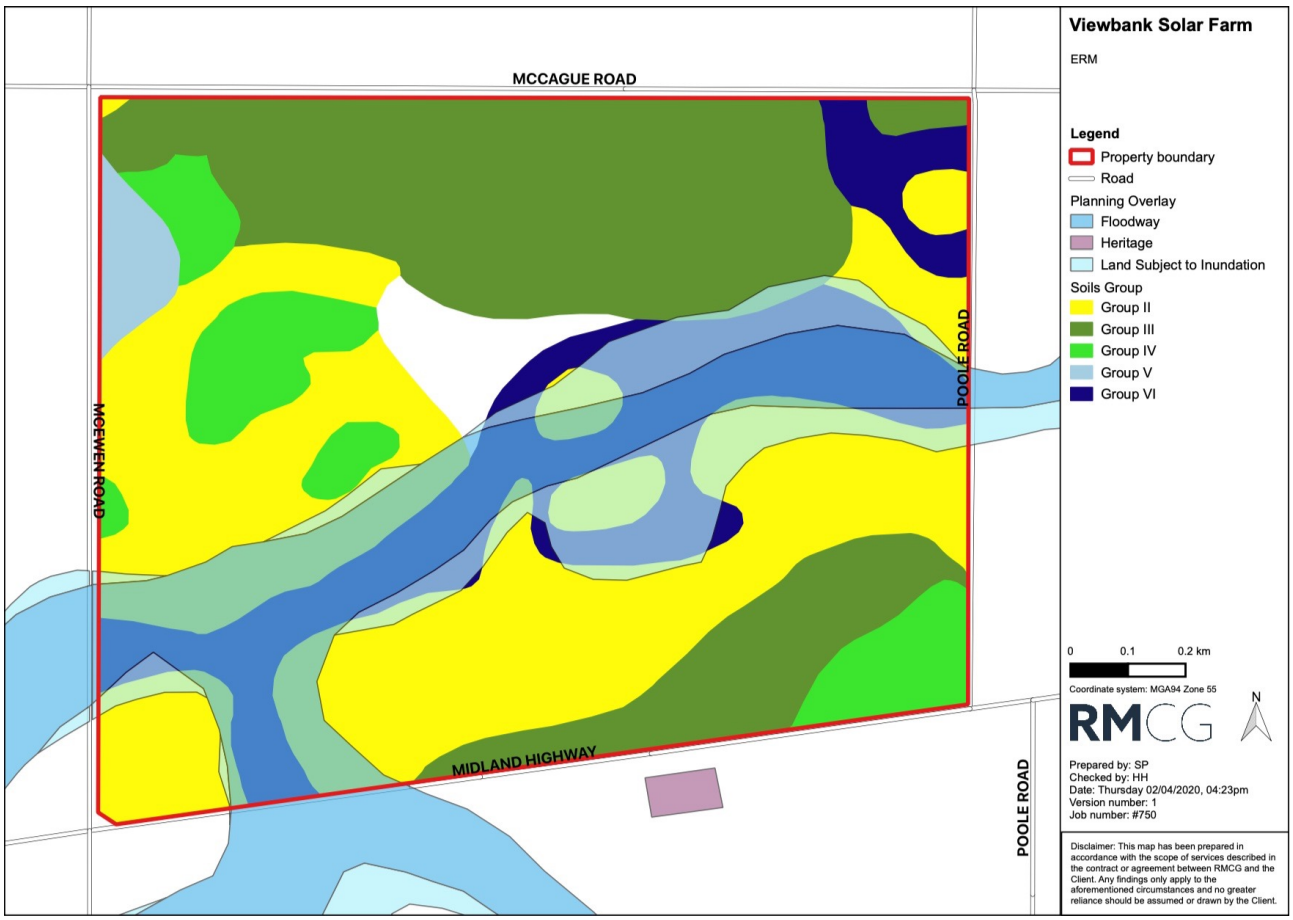


Figure 4-2: Soil Group and planning overlays

The next major soil type on the property are the Group III soils[3], these soils are also considered to be good for a range of irrigated crops. While they are good soils, they are not the most productive soils in the region (i.e.

[3] http://vro.agriculture.vic.gov.au/dpi/vro/gbbregn.nsf/pages/gb_soil_survey_legend

Group 1 and Group II soils). The other consideration for the Group III soils on this site, is that the majority are located on areas that are not developed for irrigation. A large section of this soil type is located in the northern section of the property, which is unsuitable for gravity irrigation due to its topography. It is also where the farmhouse and sheds are located. So, while this soil type is considered good and suitable for a range of irrigation crops, the topography of this area limits its irrigation potential.

The third major soil type is classified as Group VI soils. These soils are not recommended for irrigation and would represent the lowest quality soils in the region.

When looking at the site as a whole and taking into consideration the practical and physical constraints as described above, the soils on the site would not be considered as high quality soils or niche to a type of crop or other agricultural activity as described in the DELWP design and development guideline.

CLIMATE AND RAINFALL

Rainfall is another inherent site characteristic that is used to inform the agricultural capability of a site. The average rainfall is sufficient for dryland agriculture, such as winter season cereal crops, but is insufficient for high value enterprises like dairy, summer cropping or horticulture, unless there is access to irrigation.

DRAINAGE

As outlined in Section 3.2, there is a natural drainage line that transects the property from the eastern boundary to the western boundary. This has been incorporated into the irrigation drainage system for the farm and there are two drainage discharge points from the property, located on the western and eastern boundaries of the site.

There are two planning overlays on the property, a floodway overlay and a land subject to inundation overlay which are illustrated in Figure 4-3.

During high rainfall periods, there is a risk of crop loss in the areas outlined in the overlays. This will limit the agricultural production for the site during such periods.

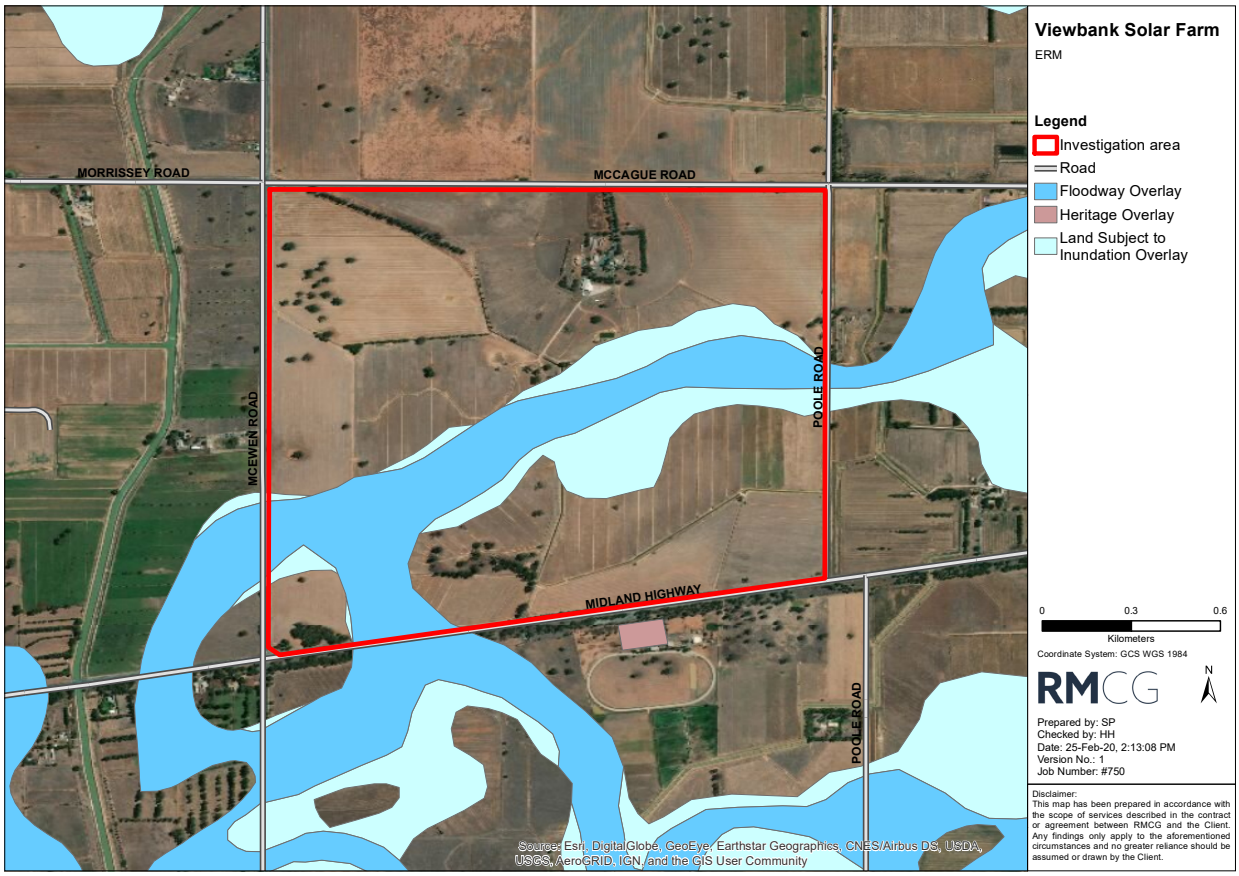


Figure 4-3: Planning Overlays

ACCESS TO IRRIGATION INFRASTRUCTURE

The site is located in Goulburn Murray Irrigation District (GMID) and has access to the irrigation delivery system via one service point.

Irrigation can be used to increase crop performance, buffer the impacts of climate change on agriculture and broaden the range of agricultural activities that can be undertaken on the site. The site has access to the irrigation delivery system. The soil types at the site would be suitable for most irrigated crops, but do not represent the best soils in the region. As previously described, there are some physical and practical considerations that also limit the irrigation potential of the site.

CONCLUSION

The property has reasonable soils, good access to drainage and is connected to the irrigation network. A high proportion of the soils are considered as good to high quality soils that are suitable for irrigation. However, due to patchwork nature of the higher quality soils, the proximity of the Group II soils to areas subject to inundation, and topography limitations of a large proportion of the Group III soils, on a whole they would not be described as high quality soils or niche to a type of crop or other agricultural activity as described in the DELWP Guidelines.

4.3 PRODUCTION LEVELS

Given the site capability assessment in Section 4.2, it is possible to determine the productive value of the site. The site is currently used as a mixed farming enterprise consisting of winter cereals, canola, and grazing (prime lambs) on annual pastures and occasional summer fodder crop. Due to the some of the practical and physical restrictions on the property as previously described, it is considered that this type of enterprise is a suitable land use for the site. It is also noted that the solar site is only 217 ha of a total area (810 ha) managed by the current farmer. The economic output from the operation has been assessed only on the 217 ha site.

To quantify agricultural output based on current use, the Livestock Farm Monitor Project, Victoria 2015-16[4] has been used as the basis of the assessment. Local ABS data has also been used to determine yields and prices for crops. The 2015/16 year has been used so that a direct comparison can be made to the most recent ABS information that is available at a Local Government Area (LGA) level to determine the relativity of the production at regional level.

PRIME LAMB PRODUCTION

The current owner indicated that they normally run 900 first cross ewes on the site and achieve lambing percentage in the order of 120%. The sheep are primarily run on the irrigation area that totals 98ha. The owner purchases in first cross ewes with the primary focus for prime lamb production. Annual pastures are watered up in the autumn and provide the bulk of the feed for the lambing ewes. The value of agricultural production is summarised in Table 4-1.

Table 4-1: Prime lamb value

PRODUCT	PRODUCTION	VALUE NET $/KG	NUMBER	TOTAL VALUE
Wool	4.4 kg/head	$6.34 /kg	900	$25,106
Prime lamb	20 kg/carcass weight	$5.09 /carcass weight	1080	$109,944
Total (lamb and wool)				$135,050

The yield and price data was sourced from Livestock Farm Monitor Project, Victoria 2015-16[5]. The lambing percentage of 120% is based communication from the owner. This lambing percentage is comparable to the Livestock Farm Monitor Project figures and therefore has been used to calculate the number of lambs sold from the site. The total value of agricultural output from the prime lamb enterprise is in the order of $135,000.

DRYLAND CROPPING

The owner indicated that typically the dryland area would be sown to:

- 30% wheat
- 30% barely
- 30% canola
- 10% oats

[4] Economic Development, Jobs, Transport and Resources , Livestock Farm Monitor Project – Victoria 2015-16 http://agriculture.vic.gov.au/__data/assets/pdf_file/0017/326312/Livestock-Farm-Monitor-Report-2015-16.pdf.

[5] Economic Development, Jobs, Transport and Resources , Livestock Farm Monitor Project – Victoria 2015-16 http://agriculture.vic.gov.au/__data/assets/pdf_file/0017/326312/Livestock-Farm-Monitor-Report-2015-16.pdf.

The owner also indicated that they achieve yields in the order of 2.5 t/ha for the cereals and 1.8 t/ha for canola. For the purpose of calculating the agricultural output of the farm, yield and price are based on ABS data[6] from the Greater Shepparton shire which is summarised in Table 4-2. The ABS yield data is comparable to the owner's figures and therefore are considered appropriate to use to provide an indication on the value of agricultural production from the site.

Table 4-2: Gross value of agricultural output, hectares and tonnes grown in the Greater Shepparton Shire

CROP	GROSS VALUE	AREA	YEILD	PRODUCTION	UNIT PRICE
Barley	$1,945,517	2814 ha	7,495 t	2.66 t/ha	$260 /t
Oats	$1,198,508	2,103 ha	3,707 t	1.76 t/ha	$323 /t
Wheat	$11,653,200	18,813 ha	42,744 t	2.27 t/ha	$273 /t
Canola	$5,294,973	8,940 ha	10,460 t	1.17 t/ha	$506 /t

Based on the ABS yield and price data, the value of the agricultural output from the site has been calculated. As outlined in Table 4-3, the total dryland area of 106 ha and the crop distribution as outlined by the farm owner have been used to undertake this calculation.

Table 4-3: Value of the cropping enterprise

CROP	AREA GROWN (HA)	FARM INCOME
Barley	32	$22,121
Oats	10	$5,698
Wheat	32	$19,822
Canola	32	$18,952
Total	106	$66,593

The total value of the cropping component from the site is in the order of $66,500.

COMBINED AGRICULTURAL OUTPUT

The total combined agricultural output from the site is assessed as being in the order of $200,000. A typical farm needs to generate about $250-500k gross income in order to have sufficient net income for one employee or one family farm. Therefore, this property is considered to have sufficient economic return to represent about 40% to 80% of a viable one family farm.

[6] ABS data for Greater Shepparton Shire 2015/2016, ABS catalogue number 7503.0

4.4 RELATIVE VALUE – REGIONAL AND STATE

To put the value of the site into a regional perspective, the relative value of production calculated in Section 4.3 can be compared to that of the local region. ABS data for 2015/16 (provided in Appendix 2), shows the total agricultural value for the Greater Shepparton Shire at $552,525,447. Therefore, the production from this property represents approximately 0.04% of the Council's agricultural production.

At a state context the economic output from this property represents 0.002% of the state's agricultural value of output ($13,079,964,644[7]).

In conclusion, the potential economic output from the site is considered to be insignificant at a regional and state level.

Data from the Regional Irrigated Land and Water Use Mapping in the Goulburn Murray Irrigation District Technical Report[8] shows that in the Central Goulburn area, where the site is located, there is a total of 35,451 ha of properties described as mixed farming, out of a total area of 173,540 ha, as shown in Figure 4-3. Therefore, the site represents approximately 0.61% of the mixed farming properties which in turn is only 20% of the area used for agriculture in the Central Goulburn irrigation area.

It is considered that the site area and potential loss of land is insignificant at a regional level and the loss of the agricultural production from the proposed site is insignificant at a regional and state level.

Categories	Murray Valley		Shepparton		Central Goulburn		Rochester		Torrumbarry		Pyramid-Boort		Totals	
	Properties (Number)	Area (ha)	Properties (Number)	Area (ha)	Properties (Number)	Area (ha)	Properties (Number)	Area (ha)	Properties (Number)	Area (ha)	Properties (Number)	Area (ha)	**Properties (Number)**	**Area (ha)**
Properties with dairy	264	26,169	103	8,049	363	37,493	155	19,758	204	26,690	53	8,561	**1,142**	**126,720**
Associated with dairy	152	12,365	81	3,678	220	11,454	97	7,774	152	11,473	63	7,201	**765**	**53,945**
Dairy cattle agistment/fodder	153	11,137	44	3,250	238	14,243	199	13,637	115	11,448	10	1,138	**759**	**54,853**
Perennial horticulture	136	4,672	227	6,482	179	5,460	9	981	389	7,086	8	4,448	**948**	**29,129**
Annual horticulture	8	794	12	283	28	2,203	25	3,501	37	1,139	5	2,120	**115**	**10,040**
Cropping	198	21,607	271	19,792	508	45,845	397	38,118	412	39,154	540	97,258	**2,326**	**261,774**
Mixed	76	4,856	292	21,561	471	35,451	201	20,000	505	23,638	95	12,610	**1,640**	**118,116**
Grazing non-dairy	456	40,540	99	6,901	113	7,578	47	3,955	418	48,197	132	26,719	**1,265**	**133,890**
Intensive animal	2	52	1	74	21	978	6	160	17	2,110	9	1,936	**56**	**5,310**
Horses	14	761	31	1,855	42	1,821	8	245	1	8	6	647	**102**	**5,337**
Lifestyle	379	5,690	645	5,755	1,454	11,014	734	4,198	760	2,835	140	776	**4,112**	**30,268**
Totals	1,838	128,643	1,806	77,680	3,637	173,540	1,878	112,327	3,010	173,778	1,061	163,414	**13,230**	**829,382**

Figure 4-4: Land uses across the water service areas in the GMID [9]

[7] ABS Catalogue no.7503.0 – Victoria's total agriculture value 2015/16 – 13,079,964,644.
[8] Goulburn Broken Catchment Management Authority 2017.
[9] Goulburn Broken Catchment Management Authority 2017.

4.5 WATER IS LIMITING RESOURCE FOR AGRICULTURAL PRODUCTION IN THE GMID

The DELWP Guidelines outline a range of considerations that need to be addressed when proposing a solar facility located within an irrigation district. In response, there is a need to provide some context to the water situation in the GMID that will demonstrate that it is not a lack of land that will limit the agricultural potential for the region, but a lack of water. The following information has been reproduced from work RMCG has done in the past and is relevant to this report to help explain why it is water and not land that is limiting production.

GMID PART OF THE SOUTHERN CATCHMENT OF THE MURRAY DARLING BASIN

The site is located within the Greater Shepparton City Council and is within the GMID, as shown in Figure 4-4.

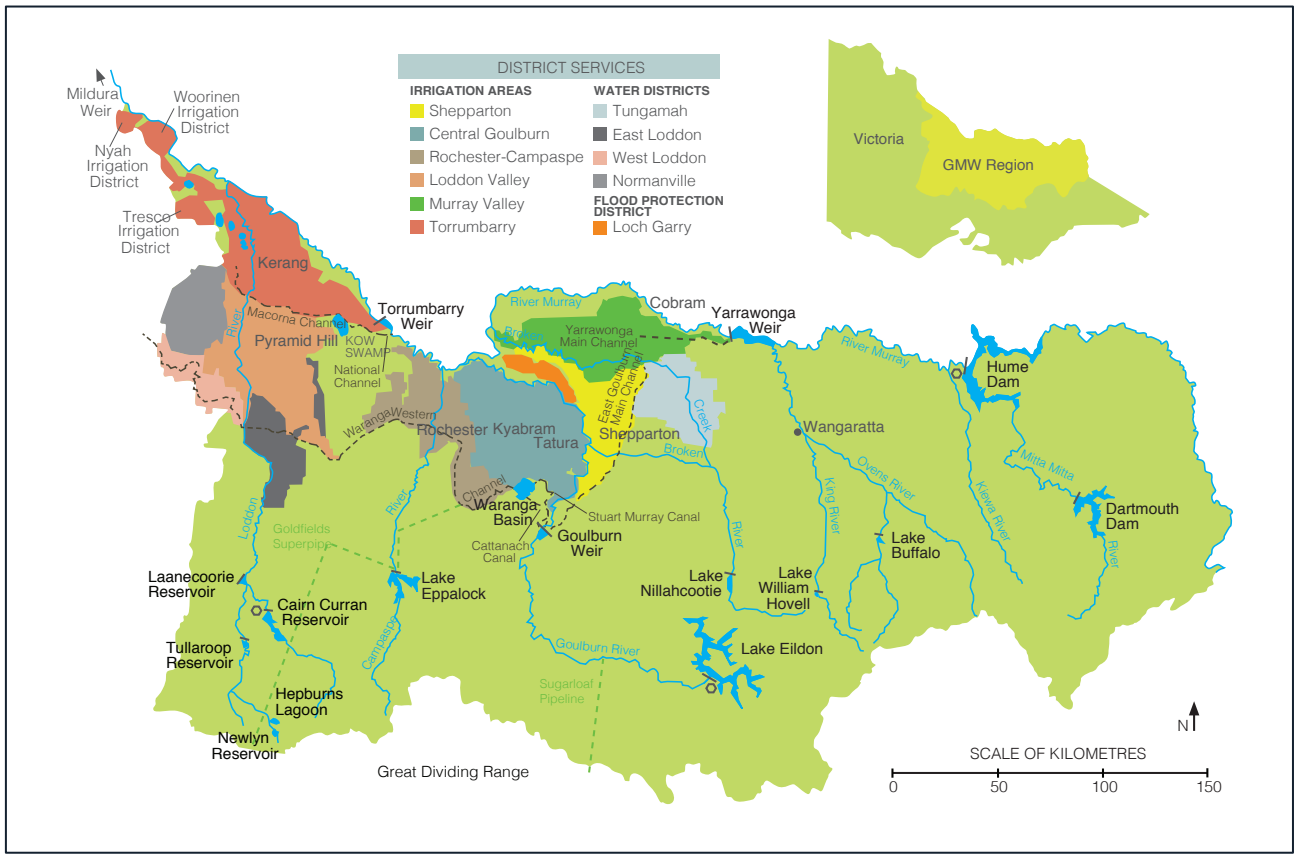


Figure 4-5: Irrigation areas within the GMID

The GMID is only one irrigation district within the Southern Catchment of the Murray Darling Basin (sMDB) as shown in Figure 4-5.

Figure 4-6: Irrigation areas within the Southern Connected Basin

Irrigation water supplied and distributed throughout the southern connected Murray Darling Basin (sMDB) is able to be transferred within and outside irrigation districts. Water is increasingly traded between farms, districts and states enabling irrigators from Shepparton (VIC), Griffith (NSW), Deniliquin (NSW), Mildura and Berri (SA) to trade water entitlements and allocations with each other to meet the long term, annual and immediate needs of their irrigated farms. The viability and success of an irrigation farm at Girgarre is no longer linked to the allocation to an individual property, or even the whole irrigation district - but rather to a competitive market from all water-users throughout the Connected Southern Murray Darling Basin. There are trade restrictions and limits but in essence it is a connected system and water will flow from one region to another based on the capacity to pay from an individual and industry perspective.

HISTORY – WATER USED TO BE TIED TO LAND

When irrigation was first developed in the GMID, water entitlements were granted to properties within the irrigation district. The water was allocated to specific parts of the land. This tied irrigated production to the land and continued up until the 1990s.

WATER TRADING HAS REDUCED THE WATER USED IN THE GMID

The advent of water trading in the 1990s and the unbundling of water entitlements from land has reduced the area of irrigated agricultural production in the GMID. This is because more and more farmers from outside the district and even irrigators interstate have developed irrigation enterprises and secured water entitlements and annual allocations from entitlement owners within the GMID. The wine industry boom around the turn of the century and the more recent cotton and almond industry expansions have driven much of the water trade.

THE BASIN PLAN AND WATER RECOVERY

Since 2000, State and Federal Governments have instigated a number of programs of 'water recovery' in order to increase water available to restore environmental flows. These programs have included the direct purchase of irrigation-water entitlements from irrigation-farmers and co-investment in water savings initiatives designed to return water to governments and to maintain on-farm irrigation performance (with less water). The largest of these programs has been the Murray Darling Basin Plan which has now recovered more than 2000 GL or approximately 20% of all water entitlements previously held by irrigators throughout the Murray Darling Basin (more than 80% from the sMDB). The proportion of water entitlement recovery from the GMID now exceeds 30% of the total number of water entitlements available previously held by irrigators in the GMID.

WATER USE IN THE GMID HAS IRREVERSIBLY CHANGED

Although the agricultural production of the GMID since its initial development more than one-hundred years ago has been based on irrigated agriculture, the factor limiting production has not been availability of farmland, but irrigation water availability. Even in the 1980s and 1990s when water use in the GMID was at its maximum, there was still insufficient water to fully irrigate all of the land available. In the 1996/97 irrigation year there was 2500 GL of water delivered in the GMID with 563,000 ha[10] irrigated with an irrigation intensity of approximately 4.5 ML/ha. A fully irrigated perennial pasture or fruit tree crop would typically use 6-10 ML/ha per annum. Thus, within the so called irrigated region of the GMID there was, and still is considerable dryland agriculture.

A report by Tim Cummings and associates in 2016[11] highlighted the change in water ownership which reflects the changes that have been experienced in the region. This report highlighted the change in water ownership by irrigators within the GMID had fallen by 40% since June 2001. Although water entitlement ownership does not reflect water usage (as irrigators can purchase and trade-in allocation water), the statistic certainly confirms that the amount of water allocated to irrigation property-owners within the GMID has fallen dramatically. This statistics are shown in Figure 4-6.

Water owner	Location		High-reliability water share volume (GL)		% change
			30 June 2001	30 June 2015	
Irrigator	LMW diverters		203	216	6%
	LMW districts		189	125	-34%
	GMW diverters		243	164	-32%
	GMW districts	Torrumbarry	378	234	-38%
		Loddon Valley	230	124	-46%
		Rochester/Campaspe	208	113	-46%
		Central Goulburn	391	237	-39%
		Shepparton	181	117	-35%
		Murray Valley	259	167	-35%
		GMID Subtotal	**1,648**	**992**	**-40%**
	Not tied to land		0	175	N/A
Water corporation	Not tied to land		0	62	N/A
Environment	Not tied to land		0	605	N/A
TOTAL			**2,283**	**2,338**	**2%**

Figure 4-7: Change in water ownership (Tim Cummings and associates 2016)

This is further reflected when looking directly at water deliveries with the GMID over time. The amount of irrigation water used by irrigation in the GMID has effectively halved from around 2,000 GL in the 1990s to around 1,000 GL in recent years, as shown in Figure 4-7. This means there is a significant amount of land previously irrigated that is now dryland.

[10] Results of Irrigated Farm Census – Dec 1998 GMW & NRE.
[11] Tim Cummings & Associates. 2016 Trends in Northern Victorian Water Trade 2001-2015 DELWP.

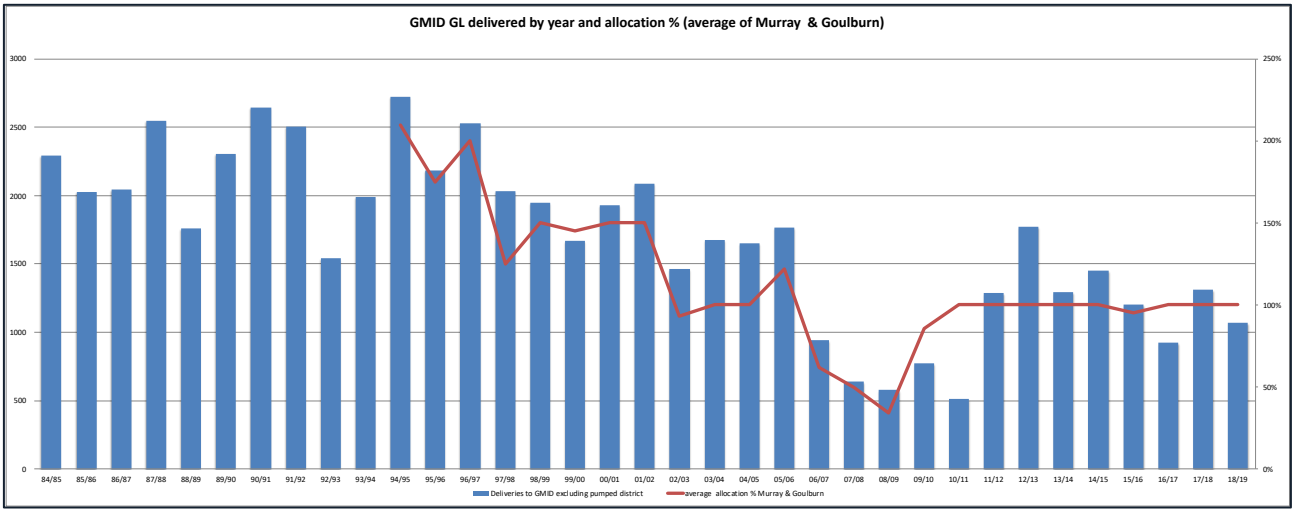


Figure 4-8: Water deliveries in the GMID[12]

In 2017 the Victorian Government published a report: *Regional Irrigated Land and Water Use Mapping in the Goulburn Murray Irrigation District, Technical Report*[13] which provides a table of land-use within the total GMID including the Central Goulburn region (a sub-area within the GMID), this is provided in Figure 4-8. The table confirms the continuing dominance of the dairy industry to the Central Goulburn area which is where the property is located (363 farms in the Central Goulburn Irrigation Area directly engaged in dairy farming and more than 60,000 ha devoted to dairy and dairy related pasture production).

Categories	Murray Valley		Shepparton		Central Goulburn		Rochester		Torrumbarry		Pyramid-Boort		Totals	
	Properties (Number)	Area (ha)	Properties (Number)	Area (ha)	Properties (Number)	Area (ha)	Properties (Number)	Area (ha)	Properties (Number)	Area (ha)	Properties (Number)	Area (ha)	Properties (Number)	Area (ha)
Properties with dairy	264	26,169	103	8,049	363	37,493	155	19,758	204	26,690	53	8,561	**1,142**	**126,720**
Associated with dairy	152	12,365	81	3,678	220	11,454	97	7,774	152	11,473	63	7,201	**765**	**53,945**
Dairy cattle agistment/fodder	153	11,137	44	3,250	238	14,243	199	13,637	115	11,448	10	1,138	**759**	**54,853**
Perennial horticulture	136	4,672	227	6,482	179	5,460	9	981	389	7,086	8	4,448	**948**	**29,129**
Annual horticulture	8	794	12	283	28	2,203	25	3,501	37	1,139	5	2,120	**115**	**10,040**
Cropping	198	21,607	271	19,792	508	45,845	397	38,118	412	39,154	540	97,258	**2,326**	**261,774**
Mixed	76	4,856	292	21,561	471	35,451	201	20,000	505	23,638	95	12,610	**1,640**	**118,116**
Grazing non-dairy	456	40,540	99	6,901	113	7,578	47	3,955	418	48,197	132	26,719	**1,265**	**133,890**
Intensive animal	2	52	1	74	21	978	6	160	17	2,110	9	1,936	**56**	**5,310**
Horses	14	761	31	1,855	42	1,821	8	245	1	8	6	647	**102**	**5,337**
Lifestyle	379	5,690	645	5,755	1,454	11,014	734	4,198	760	2,835	140	776	**4,112**	**30,268**
Totals	1,838	128,643	1,806	77,680	3,637	173,540	1,878	112,327	3,010	173,778	1,061	163,414	**13,230**	**829,382**

Figure 4-9: Land use across the water service areas in the GMID

The table above shows the total area within the irrigation area, but it does not show the actual area irrigated. Of the total area of 829,382 ha there will be tracks of land not suitable for irrigation or permanent dryland, but the report also provides the area of actual irrigation in the 2015/16 year, shown in Figure 4-9.

[12] Water deliveries sourced from GMW annual reports.

[13] Regional Irrigated Land and Water Use Mapping in the Goulburn Murray Irrigation District, Technical Report, GB CMA 2017.

Irrigated land cover/usage	Total (ha)	Percent%
Winter grain or fodder crop (e.g. wheat, barley, canola, faba beans, oats)	131,029	50.8
Annual pasture (pasture irrigated in spring and/or autumn)	62,497	24.2
Perennial pasture (pasture irrigated through to summer)	20,267	7.9
Summer grain or fodder crop (e.g. maize, millet, sorghum, soybean)	18,717	7.3
Irrigated lucerne	6,108	2.4
Stone fruit (e.g. apricot, peach, nectarine)	4,309	1.7
Pome fruit (e.g. apples, pears)	3,843	1.5
Other permanent orchard species (e.g. kiwi fruit, berries, avocados, nuts)	3,447	1.3
Grapevines	2,380	0.9
Tomatoes	2,239	0.9
Poor block (weeds only)	825	0.3
Other vegetables and annual fruit crops (e.g. melon, lettuce)	742	0.3
Turned and rested paddock or orchard	630	0.2
Other irrigated plantings (please specify)	442	0.2
Any other irrigated crops or irrigated fallow	346	0.1
Citrus fruits of all types	226	0.1
Irrigated wood lots (not shelter belts)	71	0.0
Total	**258,117**	**100.0**

Figure 4-10: Irrigated land cover/usage in the GMID[13]

The area of 258,117 ha is approximately 1/3 of the land area meaning there is around 550,000 ha of dryland or an increase of approximately 300,000 ha since the 1990's. This represents the area that typically would be able to irrigate but is without irrigation water, leading to a large increase in the area of dry-land (rainfall-only) or non-irrigated agriculture throughout the region.

CONCLUSION

It is concluded that during this period of a reduction in irrigated land, the area of land serviced with an irrigation supply and drainage network has remained largely unchanged. The available water to irrigators in the GMID, and in the Central Goulburn district has irreversibly declined. In short, the area of land able to utilise irrigation-water is now far greater than the water availability in almost every season-type throughout the GMID, including within the Central Goulburn Irrigation area.

Even if horticulture in the region grows, the volume of water available for irrigation, not the available land, will be the limiting factor.

Therefore, if this property was not available for irrigation purposes, i.e. used as a solar farm, then the total irrigated production in either the Central Goulburn district, the GMID or even the southern Connected Basin, would not change, as any available water would readily find alternative land.

In reference to the DELWP Guidelines, using the proposed site as a solar energy facility will not impact on local or regional access to water.

4.6 IMPACT ON THE IRRIGATION DISTRICT

The DELWP design and development guidelines makes specific reference to solar energy facilities in irrigation districts. There has been significant government investment in the modernising the GMID and it is important that this investment is not undermined by change in land use. As outlined in Section 4.5, water, not land, is the limiting resource in the region, thus reducing the land area available for irrigation at the site, will not impact overall system viability as all of the water available in the district will be fully utilised throughout the region.

The other important consideration for the viability of the irrigation delivery network is the capacity to maintain the infrastructure. GMW use the annual charges on delivery shares (DS) as the mechanism to pay for the

upkeep of the infrastructure. The Viewbank site has a total of 1.57 DS[14] attached to the property. There will be an annual fee charged by GMW on those delivery shares which will be paid throughout the lifetime of the solar facility.

As the solar energy facility will not impact on any of the GMW delivery channels servicing the property, nor other properties downstream from the site, the proposed development will have no impact on the integrity of the irrigation network.

After completion of the useful life of the solar facility, the property would be able to revert back to irrigation relatively easily. Once the solar infrastructure is removed, the property would be in a similar position to where it is today.

In conclusion, while the property will not be irrigated, there will still be an annual fee paid directly to GMW via DS that will contribute to the ongoing viability of the irrigation district. It is noted that there will be access to the irrigation network through the life of the project, this water would be able to be used for landscape watering if required.

[14] Provided verbally by the property owner

5 Summary of agricultural assessment

A solar energy facility is proposed to be installed at 90 McCague Road, Girgarre East, in the Goulburn Valley region. The site consists of approximately 210 ha and backs onto the Midland Highway. The guidelines which inform our assessment are the *Solar Energy Facilities Design and Development Guidelines* published by DELWP in August 2019 (subsequently referred to as the DELWP Guidelines). As solar energy facilities are often located on or close to agricultural land, the DELWP Guidelines provide specific planning strategies for the protection of agricultural land.

At a state level, farmland within irrigated areas is recognised as needing particular planning consideration. The Victorian Planning Provisions (VPPs) *Clause 14.02-3S Protection of Declared Irrigation Districts* sets out objectives and strategies to manage and protect irrigated areas.

There are a number of solar energy facilities that have been proposed within a farming zone and have been referred to VCAT or a Planning Panel. We have reviewed the findings of these referrals, which found that the proposals did not represent a loss of significant agricultural land, nor affect the ability to continue farming on neighbouring agricultural land.

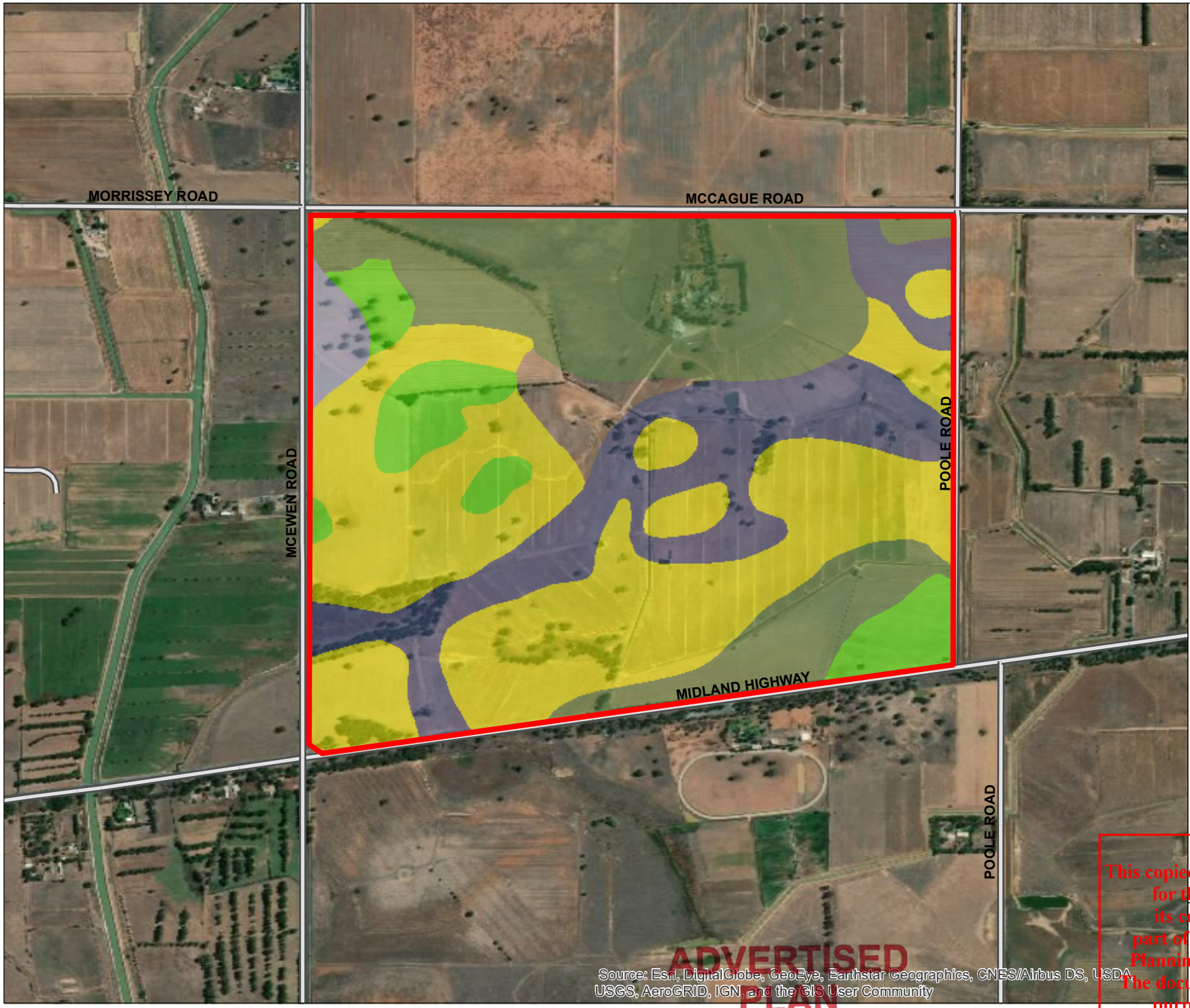
The site is currently operated as a mixed farming enterprise consisting of grazing (prime lambs) and cropping and there is existing infrastructure on the site to support this operation. The farm is located in the Goulburn Murray Irrigation District (GMID) and is connected to a modernised backbone channel. The irrigation infrastructure on the property is highly variable and ranges from poor to moderate.

The property has reasonable soils, good access to drainage and is connected to the irrigation network. A high proportion of the soils are considered as good to high quality soils that are suitable for irrigation. However, due to patchwork nature of the higher quality soils, the proximity of the Group II soils to areas subject to inundation, and topography limitations of a large proportion of the Group III soils, on a whole they would not be described as high quality soils or niche to a type of crop or other agricultural activity as described in the DELWP Guidelines.

The total combined agricultural output from the site is assessed as being in the order of $200,000. A typical farm needs to generate about $250-500k gross income in order to have sufficient net income for one employee or one family farm. Therefore, this property is considered to have sufficient economic return to represent about 40% to 80% of a viable one family farm. At a state context the economic output from this property represents 0.002% of the state's agricultural value of output.

As the solar energy facility will not impact on any of the GMW delivery channels servicing the property, nor other properties downstream from the site, the proposed development will have no impact on the integrity of the irrigation network.

Appendix 1: Soil map



Viewbank Solar Farm

ERM

Legend

- Investigation area
- Road

Soil Group

- Group II
- Group III
- Group IV
- Group V
- Group VI

0 0.3 0.6

Kilometers

Coordinate System: GCS WGS 1984

RMCG

N

Prepared by: SP
Checked by: HH
Date: 11-Mar-20, 12:33:34 PM
Version: 1
Job Number: #750

Disclaimer
This map has been prepared in accordance with the scope of services described in the contract or agreement between RMCG and the Client. Any findings, conclusions or recommendations only apply to the circumstances and no greater reliance should be assumed or drawn by the Client.

Appendix 2: ABS production data

Data source
75030DO005_201516 Value of Agricultural Commodities Produced, Australia 2015-16
Released at 11:30 am (Canberra time) 31 October 2017
Value of Agricultural Commodities Produced Australia, States and Territories and ASGS regions 2015-16

SA2	(Multiple Items)
	Shepparton - North, South, East, West

Level 1	Level 4	Sum of Gross value ($)
Broadacre crops	All other cereals for grain or seed	551
	All other crops n.e.c.	608,367
	Barley for grain	1,945,517
	Canola	5,294,973
	Faba beans	1,784,003
	Lupins	64,683
	Maize for grain	4,502,303
	Oats for grain	1,198,508
	Other oilseeds	14,095
	Other pulses	7,708
	Sorghum for grain	29,045
	Triticale for grain	320,229
	Wheat for grain	11,653,200
Fruit and nuts	All other fruit n.e.c.	2,701,554
	All other nuts n.e.c.	1,984,926
	All other orchard fruit n.e.c.	4,802,702
	All other stone fruit n.e.c.	1,154,818
	All other uses	226,056
	Apples	112,288,296
	Apricots	6,485,489
	Blueberries	33,407
	Cherries	8,543,893
	Kiwifruit	149,046
	Lemons	575
	Nectarines	1,885,182
	Oranges	83
	Peaches	13,115,299
	Pears (including Nashi)	51,183,613
	Plums	14,063,837
	Strawberries	52
	Wine production	441,368
Hay	Cereal cut for hay	9,279,745
	Lucerne cut for hay	8,117,770
	Other crops cut for hay	313,011
	Other pasture cut for hay	7,681,242
Livestock Products	Eggs	1,777
	Milk	141,023,771
	Wool	6,481,208
Livestock slaughtered and other disposals	Cattle and calves	65,609,214
	Goats	358,360
	Other n.e.c.	
	Pigs	14,723,776
	Poultry	4,575,676
	Sheep and lambs	10,223,198
Nurseries, cut flowers or cultivated turf	Cut flowers Undercover	4,203,000
	Nurseries Outdoor	1,239,938
Vegetables for human consumption	All other vegetables n.e.c.	6,695,282
	Beans (including french and runner)	78,868
	Broccoli	2,247,486
	Cabbages	101,136
	Capsicum	464,600
	Cauliflowers	29,752
	Lettuces	59,480
	Tomatoes Fresh Market (outdoor and undercover)	21,257,688
	Tomatoes Processing	1,276,087
Grand Total		**552,525,447**

SA2	(Multiple Items)
Shepparton - North, South, East, West	
Level 1	Sum of Gross value ($)
Broadacre crops	27,423,184
Fruit and nuts	219,060,196
Hay	25,391,769
Livestock Products	147,506,757
Livestock slaughtered and other disposals	95,490,224
Nurseries, cut flowers or cultivated turf	5,442,938
Vegetables for human consumption	32,210,378
Grand Total	**552,525,447**

SA2	(Multiple Items)
	Area (ha)
Sum of Estimate	214,390

Data source
75030DO005_201516 Value of Agricultural Commodities Produced, Australia 2015-16
Released at 11:30 am (Canberra time) 31 October 2017
Value of Agricultural Commodities Produced Australia, States and Territories and ASGS regions 2015-16

State	Victoria

Level 1	Level 4	Sum of Gross value ($)	Count of State
Broadacre crops	All other cereals for grain or seed	2,262,981	35
	All other crops n.e.c.	18,160,045	44
	Barley for grain	287,453,414	89
	Canola	145,476,879	83
	Chickpeas	2,767,386	11
	Cotton lint (irrigated and non-irrigated)	-	1
	Faba beans	27,278,013	47
	Lentils	47,490,458	18
	Lupins	12,745,342	42
	Maize for grain	22,150,161	23
	Mung beans	144,172	4
	Oats for grain	59,912,499	78
	Other oilseeds	2,045,871	17
	Other pulses	18,456,858	37
	Rice for grain	91,498	1
	Sorghum for grain	770,856	14
	Triticale for grain	5,274,649	48
	Wheat for grain	494,783,268	105
Fruit and nuts	All other berries n.e.c.	12,281,611	25
	All other citrus fruit n.e.c.	820,766	6
	All other fruit n.e.c.	17,554,654	16
	All other nuts n.e.c.	14,593,628	23
	All other orchard fruit n.e.c.	4,980,301	6
	All other pome fruit n.e.c.	91,024	5
	All other stone fruit n.e.c.	1,205,595	4
	All other uses	327,889,654	12
	Almonds	508,666,059	9
	Apples	196,461,710	42
	Apricots	18,106,694	23
	Avocados	8,535,291	13
	Blueberries	5,850,874	18
	Cherries	66,936,027	29
	Grapefruits	2,279,394	16
	Kiwifruit	3,417,046	5
	Lemons	14,507,758	28
	Limes	1,386,712	14
	Mandarins	15,357,702	14
	Nectarines	59,840,574	23
	Oranges	53,020,692	21
	Peaches	47,937,379	33
	Pears (including Nashi)	69,391,596	30
	Plums	26,493,022	31
	Strawberries	69,159,851	20
	Wine production	116,945,970	92
Hay	Cereal cut for hay	195,574,724	108
	Lucerne cut for hay	73,770,368	108
	Other crops cut for hay	37,028,576	89
	Other pasture cut for hay	244,751,526	169
Livestock Products	Eggs	205,038,206	124
	Milk	2,644,998,339	110
	Wool	751,197,190	177
Livestock slaughtered and other disposals	Cattle and calves	2,238,020,811	193
	Goats	80,855,293	79
	Other n.e.c.	-	149
	Pigs	318,108,994	76
	Poultry	682,888,592	145
	Sheep and lambs	1,322,577,867	177
Nurseries, cut flowers or cultivated turf	Cultivated turf	53,656,545	19
	Cut flowers Outdoor	106,685,107	50
	Cut flowers Undercover	67,825,548	27
	Nurseries Outdoor	183,605,024	105
	Nurseries Undercover	89,857,962	77
Vegetables for human consumption	All other vegetables n.e.c.	295,299,954	76
	Beans (including french and runner)	28,003,887	33
	Broccoli	58,664,558	27
	Brussels sprouts	6,842,484	11
	Cabbages	28,362,255	24
	Capsicum	14,983,074	23
	Carrots	62,749,754	16
	Cauliflowers	19,056,299	16
	Lettuces	96,687,698	30
	Melons	6,095,262	6
	Mushrooms	121,739,982	12
	Onions	12,172,287	17
	Peas fresh market	5,320,504	12
	Peas green processing	112,989	5
	Potatoes Fresh market and processing	97,412,977	30
	Pumpkins	1,864,475	28
	Sweet corn	24,199,715	12
	Tomatoes Fresh Market (outdoor and undercover)	68,306,693	34
	Tomatoes Processing	24,673,194	14
Grand Total		**13,079,964,644**	**3,663**

State	Victoria

Level 1	Sum of Gross value ($)	Count of State
Broadacre crops	1,147,264,349	697
Fruit and nuts	1,663,711,582	558
Hay	551,125,193	474
Livestock Products	3,601,233,736	411
Livestock slaughtered and other disposals	4,642,451,557	819
Nurseries, cut flowers or cultivated turf	501,630,187	278
Vegetables for human consumption	972548040.9	426
Grand Total	**13,079,964,644**	**3,663**

Sum of Estimate	**Column Labels**
Row Labels	**Area (ha)**
Victoria	12,095,255
Grand Total	**12,095,255**

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Document review and authorisation

Job Number: #750

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