



Shire of Serpentine Jarrahdale Integrated Water Management Strategy Multi-criteria Assessment

Instruction Sheet
Tuesday, 2 June 2020

INSTRUCTIONS

OVERVIEW

This multi-criteria assessment tool has been developed to assist the Shire of Serpentine Jarrahdale (SSJ) in planning and assessing concepts suitable for an integrated management strategy plan. The intent is that the assessment is to be implemented at least annually to determine if the SSJ has to progress the water strategy.

Four individual stages form the basis of this assessment, a summary of each section is provided below.

GENERAL INSTRUCTIONS

Each stage will require the user to input data for the assessment. The cells requiring input from the user are highlighted in a light blue colour (see below). Please ensure macros are enabled as this tool relies on the use of macros to function.

User input required

OPTIONS

Each concept option to be assessed is to be described on the Options tab. This information will be sourced throughout the workshop with the exception of the cost per kilolitre as a driver to ensure that any funding or avoided costs have been captured.

Note that if a yield is not specified for a particular option, that option is deemed as a 'fail' throughout the assessment and does not proceed to the subsequent assessments.

STAGE 1 - TRIGGER ASSESSMENT

The first stage of the assessment is to determine if additional water is required, and therefore whether the strategy needs to be reviewed. The trigger assessment requires the user to review all the aspects which may increase an irrigation demand over the next 2 years.

The trigger assessment is split into three tabs, one each for demand (TAD), supply (TAS) and summary (SUM). The role of each tab is summarised below:

Demand - This tab requires the user to input the Demand for each Project/Development for each region. If the demand is unknown, a demand is able to be estimated by selecting the irrigated area and an appropriate irrigation rate. The irrigation rates included are predetermined and have been separated into a low, medium and high irrigation rate based on the *WA Government's Irrigation Calculator*. Note the user **cannot** input a known **and** estimated demand. There is also a space allowance to include a map and description of the demand for record purposes.

Supply - This tab requires the user to input data for the water Supply in each region. An annual volume is required and the user is able to write a short description of each option. There is also a space allowance to include a map and description of the supply for record purposes.

Summary - This tab provides a summary of the total demand and supply for each region. The demands and supply's are summarised and a trigger is included as part of the overall assessment. The trigger to progress the assessment is: *If the demand exceeds 80% of the supply volumes. This allows some lead time before SSJ requires more water.* The user must click the 'Update Trigger Assessment' box to update the worksheet.

If the trigger is not exceeded, the assessment stops at this stage. Note that the remaining tabs will remain hidden. Should the user wish to continue the assessment, this can simply be done by ticking the "Continue with Assessment" box.

STAGE 2 - FATAL FLAW ASSESSMENT

The fatal flaw assessment requires all of the proposed water supply concepts to be reviewed for fatal flaws. Each of these flaws are required to be checked individually for each option. This process is outside of this worksheet.

A tick is given to the fatal flaw if it 'passes' and there is no flaw. If a fatal flaw is identified, the box should remain unticked and the concept is deemed as a 'fail' at this time.

If any fatal flaws for the specific option are found to fail, then that option does not proceed to the next stage and is not included in subsequent assessments. This means that the option is parked but should still be considered for future assessments.

STAGE 3 - MULTI-CRITERIA ASSESSMENT

Stage 3 comprises of a multi-criteria assessment which includes 36 questions from varying categories. Each question has designated responses which are allocated a ranking number, where a higher number indicates a better concept for that question. Each question is to be answered and a total sum is given at the top of the page.

A drop down box for each question with the allowable responses is provided. If an option does not pass the Stage 2 Fatal Flaw Assessment, it will be automatically hidden. Note that this will happen once the 'Update MCA' button is clicked (located in the 'Questions' heading cell). Please ensure you update the sheet before commencing the Stage 3 Assessment.

This approach enables the identification of areas of risk or where further work may be required, if this occurs the concept may not necessarily be unviable or may need to be park. If sufficient time allows, the necessary investigations can be implemented and the assessment revisited. The assessment may require multiple iterations. An indication of unanswered questions is provided in the summary bar located along the top of the page.

Note: The ranking of this stage alone does not determine the most viable concept, but should be considered in conjunction with the Stage 4 assessment.

STAGE 4 - COST PER KILOLITRE ASSESSMENT

The cost of the concept has significant implications on the viability of the concept, especially where the project is partially or fully funded through government grants. This stage considers the capital (CAPEX) and operational (OPEX) costs along with any funding or avoided costs to a per kilolitre water supply rate.

A target cost per kilolitre supply rate can be inputted by the user, and the options are compared to this rate. Note that this assessment does not calculate CAPEX, OPEX or cost per kilolitre and it is expected these are calculated outside this worksheet and inputted manually. The implication of funding on the cost is also to be considered as it can have a significant impact on viability. Stage 4 will ask for the cost for the concept and then the cost once funding has been considered. Once again this is a manual process outside the worksheet.

The Stage 4 assessment is to be coupled with the Stage 3 ranking assessment enabling a concept or multiple concepts to be considered depending on the situation.

Note that similarly to the Stage 3 Assessment, the options that have not passed the Stage 2 Fatal Flaw Assessment will be hidden. Select the 'Update Table' button to update the sheet before commencing the Stage 4 Assessment.

SUMMARY

A summary page is provided compiling the key results from each stage of the assessment. It is the expectation that SSJ will review the results of the assessment and select the most appropriate concept(s) to progress.

The summary table can be displayed so that the results are sorted, favouring the cost per kL results from the Stage 4 assessment. This can be done by clicking the 'Update Summary' button to update and sort the table. The top 3 total scores for the Stage 3 assessment are highlighted in green.



Shire of Serpentine Jarrahdale
Integrated Water Management Strategy
Multi-criteria Assessment

Options Description
Tuesday, 2 June 2020

Region	Demand (ML)	Option	Description	Abbreviation	Yield (ML/a)	CAPEX (\$ Mill)	OPEX (\$ Mill)	Cost per kL (4-7% RDR)
Byford – Oakland	555	1	Surface Water Harvesting from Oakland / Barriga Main Drain with MAR	Byf - SW - Oakland/Barriga MAR	4,000	\$74.60	\$3.11	\$2.15-\$2.60
		1a	Surface Water Harvesting from Oakland / Barriga Main Drain with above ground storage	Byf - SW - Oakland/Barriga AGS	4,000	\$134.10	\$2.05	\$2.10-\$2.92
		2	Integration of Option 1 with Sewer Mining	Byf - Optn 1 plus WW	4,800	\$99.50	\$3.39	\$2.20-\$2.65
		3	Woodland Grove Sporting Facility	Byf - Woodland Grove	32	\$3.20	\$0.39	\$17.70-\$20.10
Oldbury – Mundijong	750	4	Option 1 – Alternative Location	Mun - Optn 1 - Alt Location	4,000	\$74.60	\$3.11	\$2.15-\$2.60
		5	Mundijong Decentralised Wastewater System	Mun - DWS	800	\$23.90	\$1.91	\$3.95-\$4.70
		6	Decentralised Wastewater System with Surface Water from Manjedal Brook	Mun - Optn 5 plus SW	3,200	\$77.99	\$4.69	\$3.25-\$3.85
		7	Recharge Runoff from Mundijong Whitby District Sporting Facility	Mun - Whitby DSF	40	\$2.50	\$0.42	\$14.15-\$15.70
Hopeland – Serpentine - Keysbrook	340	8	Harvest of Surface Water Flows from Punrack Drain	Serp - SW Punrack Drain	4,000	\$74.60	\$3.11	\$2.15-\$2.60
		9	Construction of a Decentralised Wastewater System in Serpentine	Serp - DWS	120	\$8.98	\$1.35	\$2.45-\$2.75
		10	Gallery Recharge into Decommissioned Open Pit Mines	Serp - Open Pit Mine	40	\$2.02	\$0.30	\$10.25-\$11.45
Jarrahdale	32	11	Surface Water Harvesting from Gooralong Brook	Jarra - SW - Gooralong Brook	32	\$3.38	\$0.33	\$13.15-\$15.15
		12	Construction of a Decentralised Wastewater System for the Tourist Park	Jarra - Tourist Park DWS	8	\$2.13	\$0.52	\$80.30-\$86.50
			<i>Additional Option 1</i>					
			<i>Additional Option 2</i>					
			<i>Additional Option 3</i>					
			<i>Additional Option 4</i>					
			<i>Additional Option 5</i>					



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Stage 1 - Trigger Assessment Demands
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Trigger Assessment Demands						
Project / Development	Known Demand (ML/a)	Estimated Demand			Notes	
		Area (m ²)	Irrigation Rate (ML/Ha/a)	Estimated Demand (ML/a)		
Region: Byford - Oakford Precinct						
Kalimna Oval				N/A	N/A	Has this oval been developed / expanded or is planned in the next 24 months?
Kanidimak Road Reserve				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Briggs Park				N/A	N/A	Has this park been developed / expanded or is planned in the next 24 months?
Orton District Oval				N/A	N/A	Has this oval been developed / expanded or is planned in the next 24 months?
Plaistown Blvd (Reserve)				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Sansimeon Marri Pk, Thatcher Road				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Peppies Crescent Reserve				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Lot 333 Lipizzaner Road Byford				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Lot 1002 Castello Crescent				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Lot 850 South Western Hwy (Byford Hall)				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Woodland Grove District Oval Space				N/A	N/A	Has this oval been developed / expanded or is planned in the next 24 months?
Public Open Space, Garden Beds and Road Reserve				N/A	N/A	Are to be handed over to Council from developers to be managed or area being developed by Council.
Agricultural Demand				N/A	N/A	Is there agricultural demand that can not be met by other water supplies or presents an opportunity for SSJ?
Industrial Demand				N/A	N/A	Is there industrial demand that can not be met by other water supplies or presents an opportunity for SSJ?
Council Irrigation Demand External to SSJ				N/A	N/A	Have any councils outside of SSJ requested water?
Fire Management Initiatives				*Known demand only*		Has SSJ adopted any Fire Management Initiatives which would increase water demand?
Climate Variability Impacts				*Known demand only*		Applied as a percentage of total irrigation. This is options if demand volumes are understood with the maximum volume recorded adopted.
Total Demand for Byford - Oakford Precinct				0.00 ML/a		
Region: Oldbury - Mundijong Precinct						
Road Reserves				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Mundijong Reserve Oval				N/A	N/A	
Keirnan Park Recreational Facility				N/A	N/A	Has this park been developed / expanded or is planned in the next 24 months?
District Equine Facility				N/A	N/A	Has this facility been developed / expanded or is planned in the next 24 months?
Public Open Space, Garden Beds and Road Reserve				N/A	N/A	Are to be handed over to Council from developers to be managed or area being developed by Council.
Agricultural Demand				N/A	N/A	Is there agricultural demand that can not be met by other water supplies or presents an opportunity for SSJ?
Industrial Demand				N/A	N/A	Is there industrial demand that can not be met by other water supplies or presents an opportunity for SSJ?
Council Irrigation Demand External to SSJ				N/A	N/A	Have any councils outside of SSJ requested water?
Fire Management Initiatives				*Known demand only*		Has SSJ adopted any Fire Management Initiatives which would increase water demand?
Climate Variability Impacts				*Known demand only*		Applied as a percentage of total irrigation. This is options if demand volumes are understood with the maximum volume recorded adopted.
Total Demand for Oldbury - Mundijong Precinct				0.00 ML/a		
Region: Hopeland - Serpentine - Keysbrook Precinct						
Serpentine Courts				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Serpentine Pony Club / Sports Oval				N/A	N/A	Has this oval been developed / expanded or is planned in the next 24 months? What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Road Reserves				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Public Open Space, Garden Beds and Road Reserve				N/A	N/A	Are to be handed over to Council from developers to be managed or area being developed by Council.
Agricultural Demand				N/A	N/A	Is there agricultural demand that can not be met by other water supplies or presents an opportunity for SSJ?
Industrial Demand				N/A	N/A	Is there industrial demand that can not be met by other water supplies or presents an opportunity for SSJ?
Council Irrigation Demand External to SSJ				N/A	N/A	Have any councils outside of SSJ requested water?
Fire Management Initiatives				*Known demand only*		Has SSJ adopted any Fire Management Initiatives which would increase water demand?
Climate Variability Impacts				*Known demand only*		Applied as a percentage of total irrigation. This is options if demand volumes are understood with the maximum volume recorded adopted.
Total Demand for Hopeland - Serpentine - Keysbrook Precinct				0.00 ML/a		
Region: Jarrahdale						
St Pauls Church				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Jarrahdale Hall				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Jarrahdale Kindy and Tennis Courts				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Forest Green Reserve				N/A	N/A	What is the maximum recorded irrigation volume for the site (recorded) or what standard will the area be maintained to?
Jarrahdale Oval				N/A	N/A	Has this oval been developed / expanded or is planned in the next 24 months?
Tourist Park - wash down / irrigation				N/A	N/A	Has this facility been developed / expanded or is planned in the next 24 months?
Public Open Space, Garden Beds and Road Reserve				N/A	N/A	Are to be handed over to Council from developers to be managed or area being developed by Council.

Agricultural Demand				N/A	N/A	Is there agricultural demand that can not be met by other water supplies or presents an opportunity for SSJ?
Industrial Demand				N/A	N/A	Is there industrial demand that can not be met by other water supplies or presents an opportunity for SSJ?
Council Irrigation Demand External to SSJ				N/A	N/A	Have any councils outside of SSJ requested water?
Fire Management Initiatives		*Known demand only*				Has SSJ adopted any Fire Management Initiatives which would increase water demand?
Climate Variability Impacts		*Known demand only*				Applied as a percentage of total irrigation. This is options if demand volumes are understood with the maximum volume recorded adopted.
Total Demand for Jarrahdale					0.00	ML/a

Total Demand for the Shire (ML/a)					0.00	ML/a
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Please insert map and description here



Trigger Assessment Supplies		
Source	Annual Volume (ML/a)	Source Description
Region: Byford - Oakford Precinct		
Groundwater Allocation - Superficial Aquifer		
Groundwater Allocation - Leederville Aquifer		
Groundwater Allocation - Cattamarra Aquifer		
Surface Water Allocation / Take		
Existing Recycled Water Supply (stormwater, drainage water, surface water)		
Existing Recycled Water Supply (wastewater)		
Planned Recycled Water Supply (stormwater, drainage water, surface water)		
Planned Recycled Water Supply (wastewater)		
Accepted Scheme Water Use (no other options)		
Total Supply for Byford - Oakford Precinct Region		0 ML/a
Region: Oldbury - Mundijong Precinct		
Groundwater Allocation - Superficial Aquifer		
Groundwater Allocation - Leederville Aquifer		
Groundwater Allocation - Cattamarra Aquifer		
Surface Water Allocation / Take		
Existing Recycled Water Supply (stormwater, drainage water, surface water)		
Existing Recycled Water Supply (wastewater)		
Planned Recycled Water Supply (stormwater, drainage water, surface water)		
Planned Recycled Water Supply (wastewater)		
Accepted Scheme Water Use (no other options)		
Total Supply for Oldbury - Mundijong Precinct		0 ML/a
Region: Hopeland - Serpentine - Keysbrook Precinct		
Groundwater Allocation - Superficial Aquifer		
Groundwater Allocation - Leederville Aquifer		
Groundwater Allocation - Cattamarra Aquifer		
Surface Water Allocation / Take		
Existing Recycled Water Supply (stormwater, drainage water, surface water)		
Existing Recycled Water Supply (wastewater)		
Planned Recycled Water Supply (stormwater, drainage water, surface water)		
Planned Recycled Water Supply (wastewater)		
Accepted Scheme Water Use (no other options)		
Total Supply for Hopeland - Serpentine - Keysbrook Precinct		0 ML/a
Region: Jarrahdale		
Groundwater Allocation - Fractured Rock Aquifer		
Surface Water Allocation / Take		
Existing Recycled Water Supply (stormwater, drainage water, surface water)		
Existing Recycled Water Supply (wastewater)		
Planned Recycled Water Supply (stormwater, drainage water, surface water)		
Planned Recycled Water Supply (wastewater)		
Accepted Scheme Water Use (no other options)		
Total Supply for Jarrahdale		0 ML/a
Total Supply Volume (ML/a)		0 ML/a

Please insert map and description here



Shire of Serpentine Jarrahdale
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Stage 1 - Trigger Assessment Summary

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Stage 1 Summary		
Region	Demand (ML/a)	Supply (ML/a)
Byford - Oakford Precinct	0	0
Oldbury - Mundijong Precinct	0	0
Hopeland - Serpentine - Keysbrook Precinct	0	0
Jarrahdale	0	0
Total	0	0

Trigger Assessment	Supply is okay
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Continue with Assessment?	<input type="checkbox"/>
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