

O. Wye River and Separation Creek Locality Report

1o. Introduction

Wye River and Separation Creek are two separate adjacent localities, with respective towns, that are located along the south-eastern coastline of COS approximately 23km northeast of Apollo Bay. They are located in the heavily vegetated foothills of the south-eastern section of the Otway Ranges. The localities are not located within a DWSC.

Previous studies have found that it is not technically feasible to sewer the towns, particularly due to the heavily vegetated steep slopes and landslip potential of the region. Extensive assessment, outlined in the background documentation listed below, has been conducted within this region about the perceived environmental and public health risks in both the Wye River and Separation Creek estuaries associated with DWM systems.

There are approximately 393 and 377 unsewered properties/parcels located within the Wye River locality and town, respectively, and 136 and 121 in the Separation Creek locality and town, respectively. There are 147 and 85 DWM system permits that have been inspected to date by COS for Wye River and Separation Creek respectively. The current DWM permits and their associated treatment system and LAA method within the Wye River and Separation Creek localities are summarised as follows:

Wye River:

- 81 AWTS (24 drip irrigation, 2 trenches, 11 irrigation, 16 subsurface irrigation and 28 unknown);
- 1 composting toilet (1 unknown);
- 31 septic tanks (5 trenches and 26 unknown);
- 5 worm farms (3 trenches and 3 irrigation); and
- 25 unknown (5 drip irrigation, 1 trench, 1 irrigation and 18 unknown).

Separation Creek:

- 34 AWTS (8 drip irrigation, 5 trenches, 4 irrigation, 7 subsurface irrigation, 10 unknown);
- 21 sand filters (21 subsurface irrigation);
- 15 septic tanks (1 subsurface irrigation, 1 trench and 13 unknown); and
- 15 unknown (2 trenches, 2 subsurface irrigation and 11 unknown).

There have been two official complaints relating to DWM systems directed to COS over the past year (2015); failed land application area with improvement directed by COS, and a system failing (odour) and unsuitably sized for intermittent holiday loading.

No field investigations were conducted in the Wye River and Separation Creek localities.

2o. Background Documentation

Refer to the following documents for additional detail regarding the localities.

- Wye River and Separation Creek Site Survey Property Reports (November 2013);

- Wye River and Separation Creek Quantitative Microbial Risk Assessment and Ecological Risk Assessment (September 2014);
- Issues Paper Wastewater Management Wye River and Separation Creek (May 2002);
- Wye River Drainage Reserve Land Management Plan: Assessment and Recommendations (February 2012);
- Colac Otway Shire Coastal Community Revitalisation Project (April 2003);
- Colac Otway Shire, Three Towns Stormwater Management Strategy, Concept Study (October 2004);
- Concept Design for Wye River Separation Creek and Kennett River, (June 2006);
- Kennett River, Wye River and Separation Creek Structure Plans (February 2008);
- GIS Atlas - Climate Paper (June, 2000);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

30. Summary of Constraints to DWM

Characteristic	Description
Climate Zone	Zone 2.
Surface waterways & catchments	The localities are not located within a DWSC. Both Separation Creek and Wye River form the major waterways within this region and confluence with the Southern Ocean. Additional waterways within Separation Creek include Jamieson Creek and Cumberland River. Additional waterways within Wye River include Monash Gully and Hitchcock Gully.
Groundwater	Proximity to groundwater bores: insignificant (only one).
Land subject to inundation	Along the confluences of Wye River and Separation Creek within the towns.
Useable lot area Town (Locality)	High: WR 330 (334) SC 119 (122) Moderate: WR 45 (45) SC 1 (4) Low: WR 2 (11) SC 1 (10) Compliant: WR 0 (3) SC 0 (0)
Minimum lot size compliance with Planning Scheme Zoning	The localities are predominantly zoned Rural Conservation Zone and Public Conservation and Resource Zone. The towns are predominantly zoned Township Zone. The majority of properties/parcels are compliant, with only the larger properties/parcels adjacent to the towns non-compliant. These are prescribed minimum lot sizes for subdivisions within the Township Zone, under the provisions of Design and Development Overlay

Characteristic	Description
	Schedule 4 (DDO4 – Coastal Towns: Skenes Creek, Kennett River, Wye River and Separation Creek). Compliant: WR 367 (370) SC 119 (199) Non-compliant: WR 10 (23) SC 2 (17)
Slope Town (Locality)	High: WR 363 (379) SC 102 (117) Moderate: WR 7 (7) SC 5 (5) Low: WR 7 (7) SC 14 (14)
Geology	Eumeralla Formation of the Otway Group with alluvial flood plain deposits.
Soil suitability Town (Locality)	High: WR 0 (0) SC 0 (0) Moderate: WR 393 (377) SC 121 (136) Low: WR 0 (0) SC 0 (0) Along the coastline and the towns consists of soil landscape unit '64' (moderate rating) which forms in the similar landscape as detailed in '61'. It consists of brown texture contrast soils to 0.9m depth. The soils consist of weakly structured clay sand over strongly structured clay loam.
Sensitivity Overlay	No depth to groundwater data. Landslip: extensive, particularly around coastal extents around the town. Vegetation: all land surrounding the town is defined as Great Otway National Park and Wye River Coastal Reserve.
Sensitivity Analysis Rating Town (Locality)	Very High: WR 0 (0) SC 0 (0) High: WR 364 (368) SC 106 (113) Moderate: WR 13 (25) SC 15 (23) Low: WR 0 (0) SC 0 (0)

4o. Sensitivity Analysis (Maps)

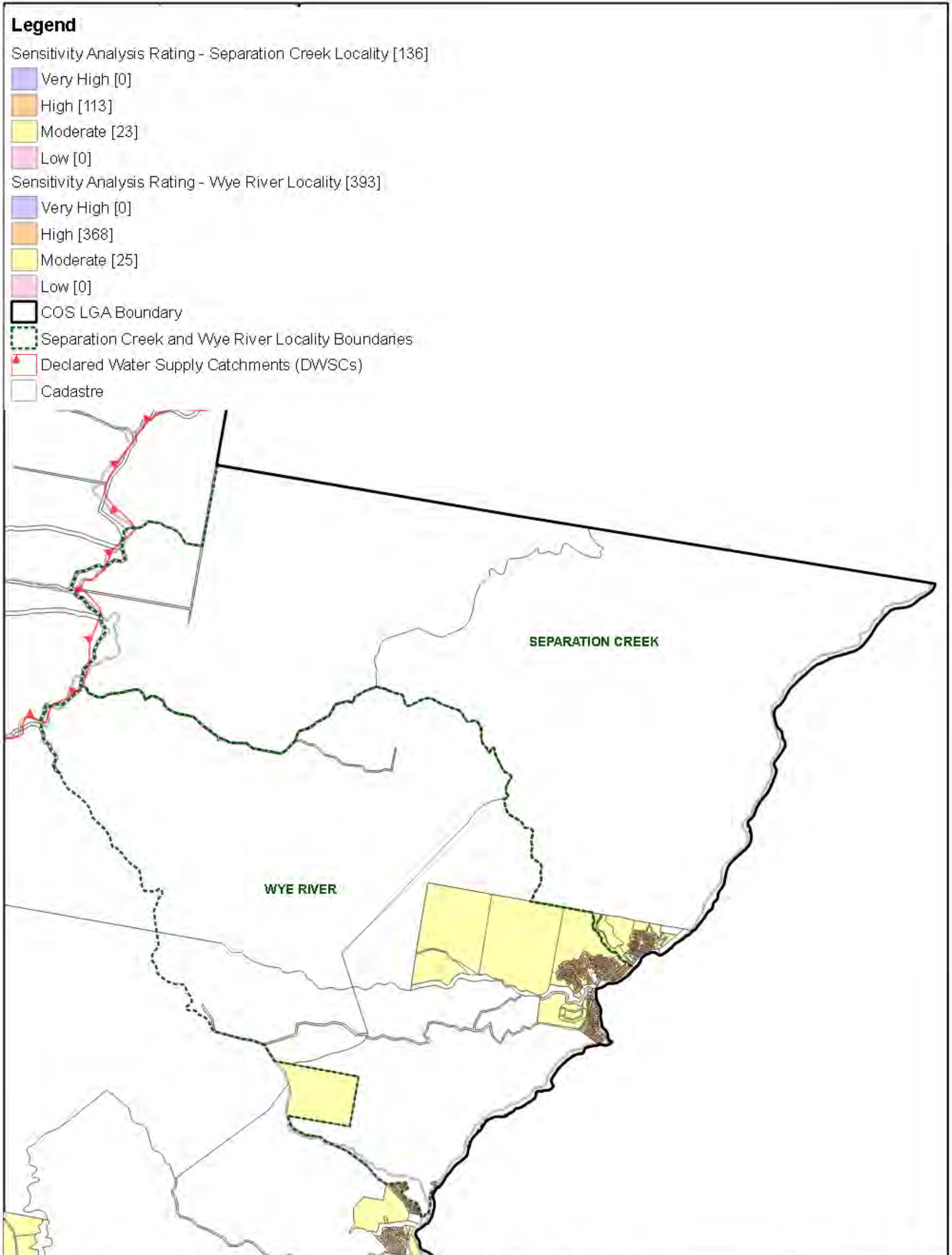


Figure 01: Sensitivity Analysis - Separation Creek and Wye River Localities

Colac Otway Shire DWMP Review

Whitehead & Associates Environmental Consultants

0 1 2 3 4 5 km
(Approx Scale)

Revision	2
Drawn	JK
Approved	MS

Legend

Sensitivity Analysis Rating - Separation Creek Town Cadastre [121]

- Very High [0]
- High [106]
- Moderate [15]
- Low [0]

Sensitivity Analysis Rating - Wye River Town Cadastre [377]

- Very High [0]
- High [364]
- Moderate [13]
- Low [0]

- COS LGA Boundary
- Separation Creek and Wye River Locality Boundaries
- Separation Creek and Wye River Town Boundary
- Declared Water Supply Catchments (DWSCs)
- Cadastre

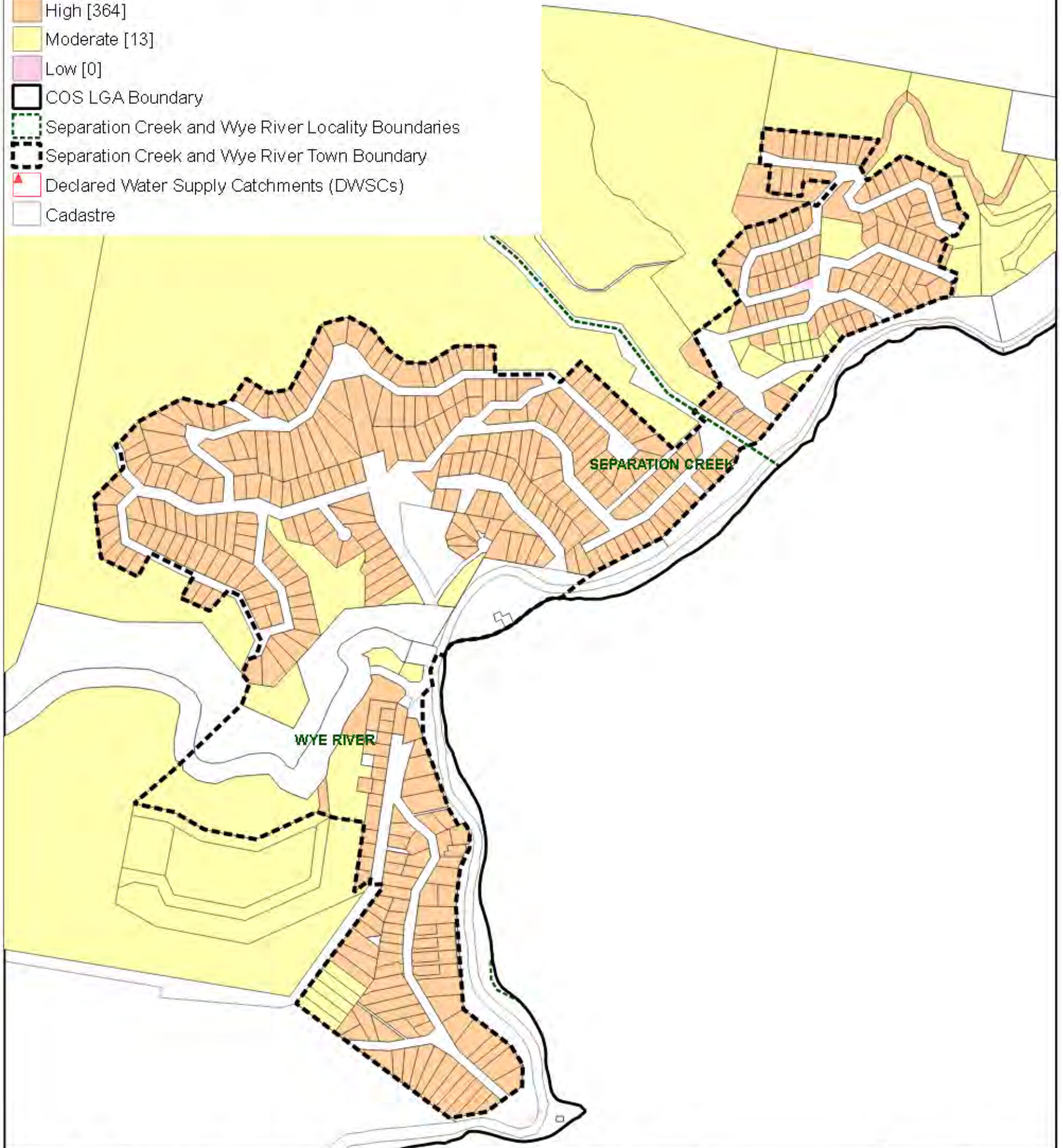
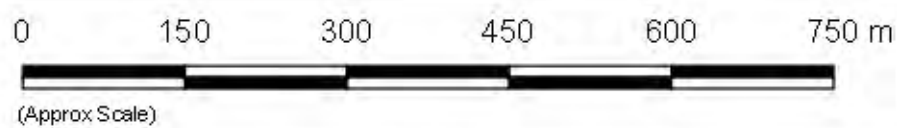


Figure o2: Sensitivity Analysis - Separation Creek and Wye River Towns

Colac Otway Shire DWMP Review



Revision	1
Drawn	JK
Approved	MS

5o. System Selection

Soil types vary significantly in the Wye River and Separation Creek localities, depending on position in the landscape (i.e. sand deltas or hill slopes). Appendix A of the EPA Code of Practice (2013) prohibits conventional and modified trenches and beds as well as LPED systems on Category 1 soils (sands), which preclude these systems on the delta areas. Landslip risks and land gradients are major constraints for DWM on properties/parcels located on the hillslopes in these localities. As such, site-specific LCA investigations and system designs are recommended; however the sizing tables (below) provide some guidance on which systems may be appropriate. Note that the DIR for subsurface irrigation systems has not been reduced to account for slopes above 10% (as is recommended in AS/NZS 1547:2012). Surface irrigation is not recommended on slopes greater than 10%.

6o. System Sizing Tables

Sizing Tables for each system type were created using conservative monthly water balances, following methods described in the MAV Model LCA, 2014. Monthly 70th percentile rainfall and average evapotranspiration data for the Wye River and Separation Creek localities was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained properties/parcels.

Sizing Tables for the Wye River and Separation Creek localities are provided below.

7o. General Conclusion

The properties/parcels within the localities have been assigned a Moderate or High Sensitivity Rating to sustainable DWM, with the majority of the towns assigned as High. Both Standard and Detailed LCAs will be required, with the use of System Sizing Tables deemed appropriate for the Standard LCAs. Particular attention needs to be directed towards ensuring that the DWM systems are sized based on the limiting soil horizon and that the systems selected are appropriate for steeper slopes with correct construction. The majority of properties/parcels within the region also have less than 1,500m² of useable area for DWM, which also does not exclude heavily vegetated areas. This will limit design options and it is imperative that the LCA DWM system design ensures that DWM is contained on-site. The area is also extensively considered to be prone to landslip; a geotechnical report by a suitably qualified person will need to be conducted to address this constraint.

Wye River and Separation Creek										
Drip and Spray Irrigation Systems* - Secondary Treated Effluent only - Slopes or Sand Delta										
	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Clay Loams (4)	Light Clays (5)	Medium to Heavy Clays (6)			
	DIR (mm)	5	5	4	3.5	3	N/A (Alternative Land Application System Required)			
Development Type	Daily (L/day)	Total min. irrigation area required for zero wet weather effluent storage (m ²)†								
5 + bedroom residence	1,080	332	480	616	862					
4 bedroom residence	900	277	400	514	718					
1-3 bedroom residence	720	222	320	411	575					
Note: * irrigation system sizes are based on the assumption that the land application area is less than 10% slope. Reductions in DIR apply for slopes above 10% according to Table M2 of AS1547:2012										
† not including spacing or setbacks										
Conventional Absorption Trenches and Beds - Primary Treated Effluent - Slopes only (not Sand Delta)										
	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Weak Loams & High/Mod Clay Loams (3 & 4)	Weak Clay Loams (4)	Light Clays (5)	Massive Clay Loams (4)	Medium to Heavy Clays (6)	
	DLR (mm)	20*	20*	15	10	6	5	4	N/A (Alternative Land Application System Required)	
Development Type	Daily (L/day)	Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing or setbacks								
5 + bedroom residence	1,080	61	84	136	274	366	553			
4 bedroom residence	900	51	70	114	228	305	461			
1-3 bedroom residence	720	41	56	91	183	244	369			
Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high watertable, including seasonal and perched watertables. Value based on average of conservative rate and maximum rate for Category 2b and 3a soils in AS1547:2012										
Evapotranspiration-Absorption Trenches and Beds - Primary Treated Effluent (Category 1 to 5) and Secondary Treated Effluent only (Category 6) - Slopes only (not sand delta)										
	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3a)	Weak/Massive Loams (3b)	High/Mod Clay Loams (4a)	Weak Clay Loams (4b) & Strong Light Clays (5a)	Massive Clay Loams (4c) and Mod & Weak Light Clays (5b, 5c)	Medium to Heavy Clays (6) - Secondary Effluent Only	
	DLR (mm)	20*	20*	15	10	12	8	5	5	
Development Type	Daily (L/day)	Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks								
5 + bedroom residence	1,080	61	84	136	109	182	366			
4 bedroom residence	900	51	70	114	91	152	305			
1-3 bedroom residence	720	41	56	91	73	121	244			
Note: * Gravels, Sands and sandy loams are unsuitable for conventional absorption trenches and beds if there is a high watertable, including seasonal and perched watertables. Value based on average of conservative rate and maximum rate for Category 2b and 3a soils in AS1547:2012										
LPED Irrigation Systems - Primary or Secondary Treated Effluent - Slopes only (not Sand Delta)										
	Soil Category	Gravels & Sands (1)	Sandy Loams (2)	Loams (3)	Clay Loams (4)	Light Clays (5)	Medium to Heavy Clays (6)			
	DIR (mm)	N/A (Alternative Land Application System Required)	4	3.5	3	N/A (Alternative Land Application System Required)	N/A (Alternative Land Application System Required)			
Development Type	Daily (L/day)		Total min. basal or 'wetted area'†							
5 + bedroom residence	1,080		553	743	1,133					
4 bedroom residence	900		461	620	944					
1-3 bedroom residence	720	369	496	755						
† required for zero wet weather storage (m ²) not including spacing & setbacks										
Wick Trenches and Beds - Secondary Treated Effluent Only - Slopes or Sand Delta										
	Soil Category	Gravels & Sands (1)	Sandy Loams (2) Loams (3) & High/Mod Clay Loams (4a,b)	Weak Clay Loams (4)	Massive Clay Loams (4)	Strong Light Clays (5a)	Moderate Light Clays (5b)	Weak Light Clays (5c)	Medium to Heavy Clays (6)	
	DLR (mm)	25	30	20	10	12	8	8	5	
Development Type	Daily (L/day)	Total min. basal or 'wetted area' required for zero wet weather storage (m ²) not including spacing & setbacks								
5 + bedroom residence	1,080	48	39	61	136	109	182	366		
4 bedroom residence	900	40	33	51	114	91	152	305		
1-3 bedroom residence	720	32	26	41	91	73	121	244		