

N. Lavers Hill Locality Report

1n. Introduction

Lavers Hill is located approximately 41km southwest of Colac within the southern section of COS. The locality centres on a narrow ridgeline on the Great Ocean Road. The landform consists of undulating, dissected crests and rolling hills of the Otway Ranges. Notably, the locality on the northern side of the ridgeline is located within the Gellibrand River (South Otway) DWSC as indicated by the surface water informative map A1, Appendix A.

There are approximately 204 and 84 unsewered properties/parcels located within the Lavers Hill locality and town, with 42 DWM system permits that have been inspected to date by COS. The current DWM permits and their associated treatment system and LAA method within the Lavers Hill locality are summarised as follows:

- 12 AWTS (4 drip irrigation, 3 trenches, 1 subsurface irrigation and 4 unknown);
- 12 septic tanks (5 trenches, 1 subsurface irrigation and 6 unknown); and
- 18 unknown (11 trenches, 1 irrigation, 1 subsurface irrigation and 5 unknown).

2n. Background Documentation

Refer to the following documents for additional detail regarding the locality:

- Amended Urban Design Framework Plan for Lavers Hill (June, 2006);
- COS Planning Scheme; and
- Rural Living Strategy (2011).

3n. Site Assessment Results

The following table summarises the results from the representative audits conducted by Consultant staff in September 2014.

Characteristic	Description
Land use	Comprises a range of land uses, including dairy, forestry, rural living and tourism.
Occupancy rates	2.3 (Part of the Beech Forest State Suburb, ABS Census, 2011).
Typical soils	Gradational profile with very dark grey brown silty clay loam topsoil becoming mottled with dark grey brown and dark yellow brown between 40-60 cm, then more strongly mottled dark yellow brown, yellow brown and grey brown silty clay to 80+ cm. Drainage and permeability are variable depending on slope and position.
AS/NZS 1547:2012 soil categories	4 (Clay Loams) and 5 (Light Clays).
Existing Systems	Separate Blackwater and Greywater Of the six systems inspected during field investigations, two or three

Characteristic	Description
	<p>systems (33-50%) comprised separate blackwater treatment in a septic tank, with direct greywater diversion to an adjacent paddock or within the property boundary.</p> <p>The blackwater septic tanks were typically 30+ years old (or not found) and the time since last pump-out was generally unknown (partly due to owner not being home to ascertain). Septic effluent discharged to one or more conventional absorption trenches (or was assumed to if trenches could not be identified). The trench dimensions were generally unclear, and it is likely that most trenches were undersized for the number of bedrooms. One property had poorly-treated blackwater effluent being discharged to the ground surface from a broken pipe. LAA slopes ranged from 2-10%.</p> <p>Combined Blackwater and Greywater</p> <p>Three or four systems (50-67%) inspected have a combined wastewater treatment system, or were assumed to have based on layout of pipework and age of dwelling. This included one combined AWTS (less than 2 years old) for a commercial property, and a retrofitted AWTS using one of three existing septic tanks on another commercial property.</p> <p>Septic tank effluent discharged to a series of conventional absorption trenches in LAAs generally of less than 4% slope. Most trenches could be identified and all were undersized for the number of bedrooms and/or the type of property.</p> <p>The standalone AWTS discharged effluent to subsurface irrigation which appeared to be undersized based on the likely patronage over the peak tourism season, and had boggy sections.</p> <p>The retrofitted AWTS discharged effluent to an undersized trench LAA.</p>

4n. Summary of Constraints to DWM

Characteristic	Description
Climate Zone	The town is included within Zone 4 and part of the surrounding locality is located within Zone 3.
Surface waterways & catchments	Lavers Hill is similar to Beech Forest, whereby the northern half of the locality is within a DWSC, Gellibrand River. The DWSC boundary runs along the ridgeline which forms the main road which divides the town. The waterways include: Chapple Creek South and North Branch, Skinner Creek, Sandy Creek, Melba Gully and Ford River West Branch.
Groundwater	Proximity to groundwater bores: Nil.
Land subject to	Nil

Characteristic	Description
inundation	
Useable lot area Town (Locality)	High: 52 (65) Moderate: 20 (26) Low: 12 (97) Compliant: 0 (16)
Minimum lot size compliance with Planning Scheme Zoning	The locality is predominantly zoned Farming Zone and Public Conservation and Resource Zone. The town is zoned Township Zone. Compliance is variable throughout the locality, with the majority of the properties/parcels on the southern side of the main road outside of the DWSC non-compliant. Compliant: 83 (113) Non-compliant: 1 (91)
Slope Town (Locality)	High: 26 (103) Moderate: 23 (56) Low: 35 (45)
Geology	Predominately Eumeralla Formation of the Otway Group, with Wiridjil Gravel Member of the Pebble Point Formation to the northwest.
Soil suitability Town (Locality)	High: 84 (189) Moderate: 0 (15) Low: 0 (0) The ridgeline and town consists of soil landscape unit '60' which form on rolling hills along the top of the Otway Ranges. The soil consists of brown friable gradational soils with weakly structured clay loam over light clay to 0.9m depth. Limitations include restricted drainage. Flanking either side of '60' is soil landscape unit '61' which forms on the deeply dissected hills of the Otway Ranges and consists of brown gradational soils to 1.2m depth. The soils consist of moderately structured silty loam over clay loam. Limitations include acidity and restricted drainage.
Sensitivity Overlay	No depth to groundwater data. Landslip: minimal. Vegetation: extensive regions of Great Otway National Park and Otway Forest Park primarily to the north of the town.
Sensitivity	Very High: 29 (41)

Characteristic	Description
Analysis Rating	High: 55 (134)
Town (Locality)	Moderate: 0 (29) Low: 0 (0)

5n. Sensitivity Analysis (Maps)

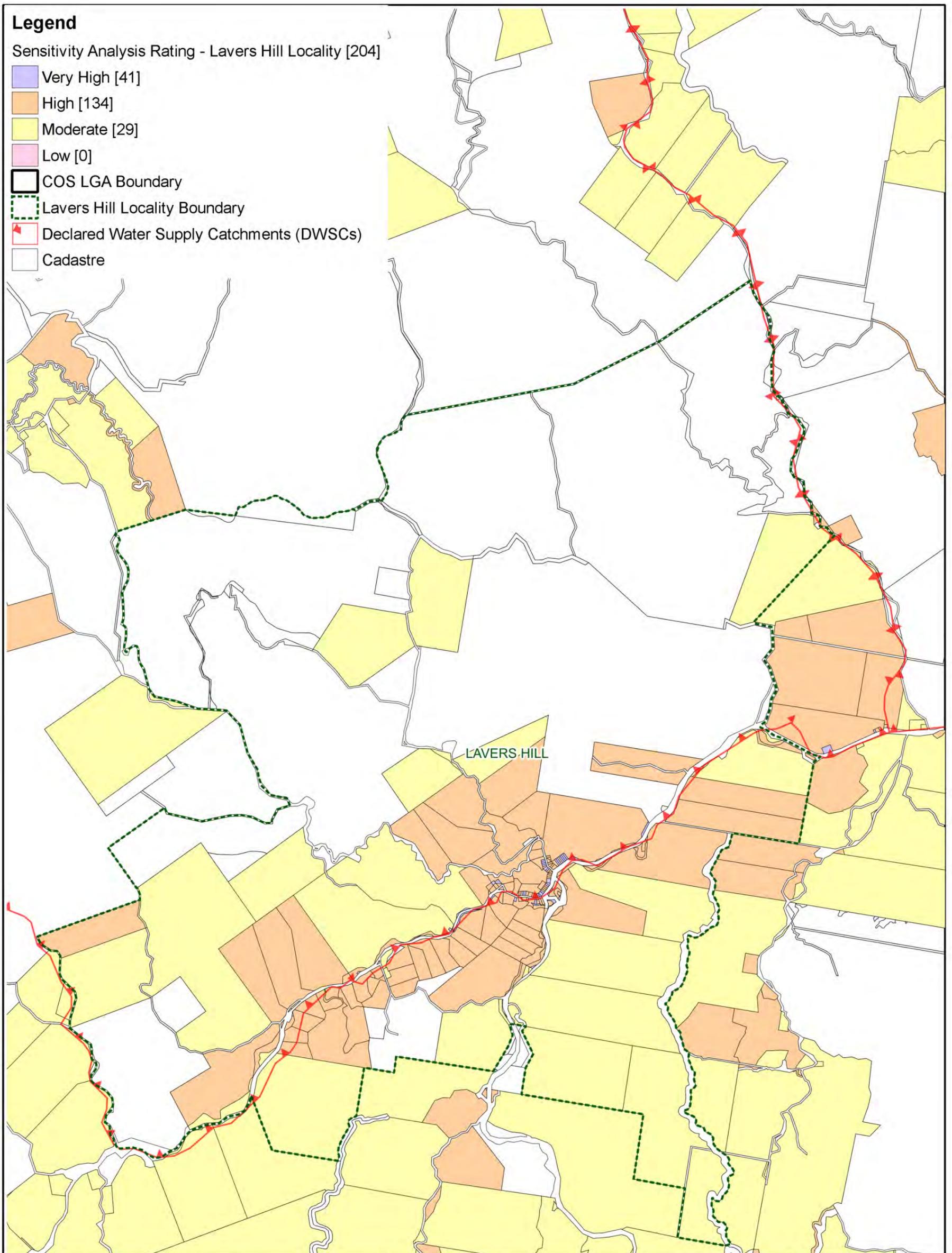
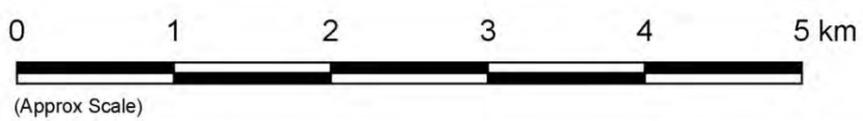


Figure n1: Sensitivity Analysis - Lavers Hill Locality

Colac Otway Shire DWMP Review



Revision	2
Drawn	JK
Approved	MS

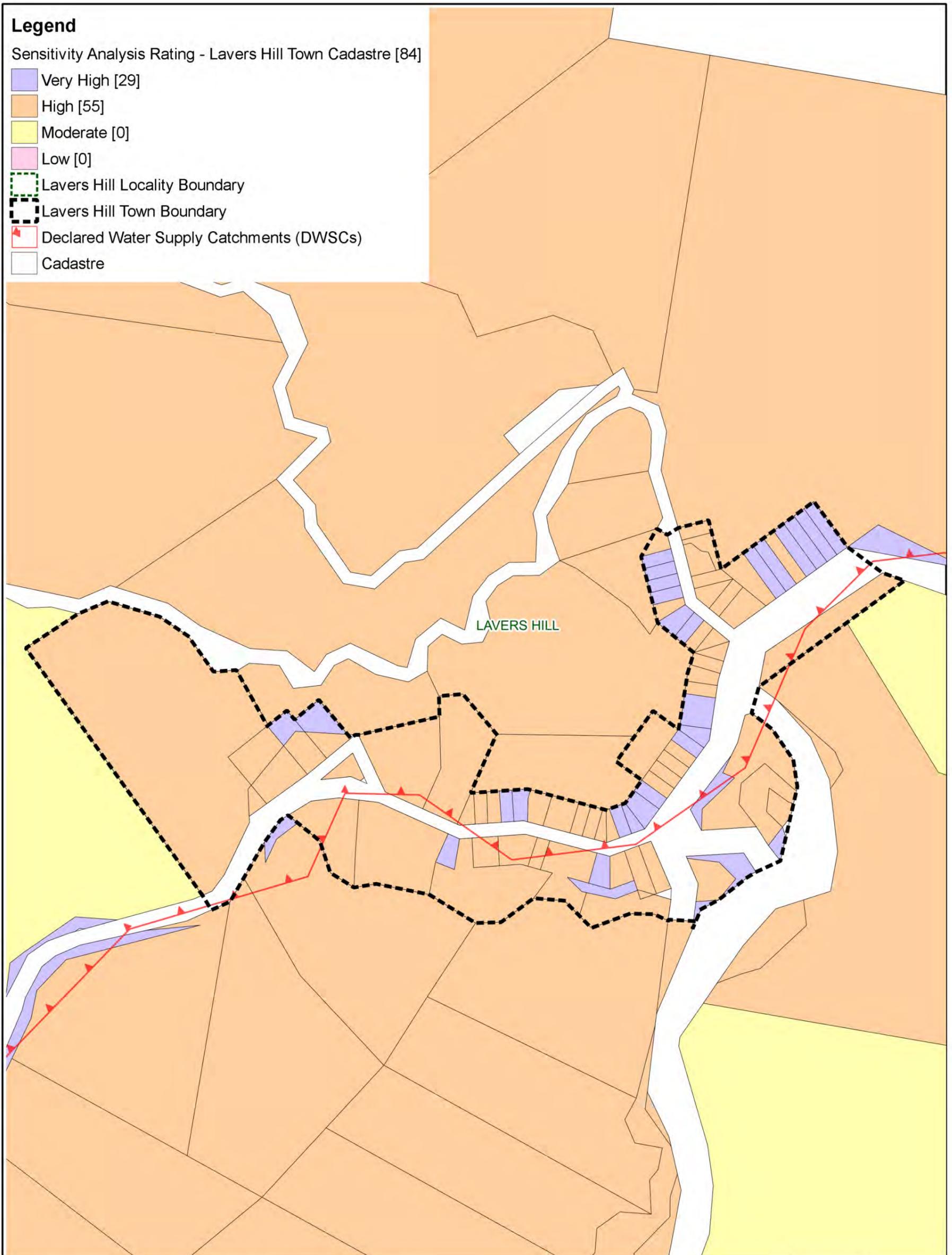


Figure n2: Sensitivity Analysis - Lavers Hill Town			
Colac Otway Shire DWMP Review			
 Whitehead & Associates Environmental Consultants	0 150 300 450 600 750 m  (Approx Scale)		Revision 3
			Drawn JK
			Approved MS

6n. System Selection

Due to the dominance of heavy-textured soils in the Lavers Hill locality, conventional absorption trenches and beds are not likely to be feasible and are discouraged. Appendix A of the EPA Code of Practice (2013) prohibits LPED systems on Category 5 and 6 soils (medium to heavy clays).

The wet climate of the Lavers Hill area makes it a high risk for DWM and site-specific, detailed land capability assessment and design will be required for unsewered properties/parcels in this area. 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.

EPA Code of Practice (2013) (Section 2.2.2) identifies secondary treatment standard (or better) followed by subsurface pressure-compensating irrigation as current best-practice in Victoria for substantially reducing the risk associated with unsewered development. Further, the Code describes a “Wick trench/bed” land application option that may be incorporated with secondary treatment for consideration on sites constrained by climate or lot ‘useable area’, particularly within the DWSCs. Any variation from this best-practice approach must be provided with detailed supporting information to demonstrate suitability.

Sizing Tables (discussed below) are not applicable for the Lavers Hill locality.

7n. System Sizing Tables

Sizing Tables for each system type were tested using conservative monthly water balances, following methods described in the MAV Model LCA, 2014. Monthly 70th percentile rainfall was sourced from the Wyelangta BoM station (090087) and average evapotranspiration data for Lavers Hill 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.

70th percentile monthly rainfall exceeds average monthly evapotranspiration for the entire ‘design’ climate year in and around Lavers Hill. As a result, there is a month-to-month surplus of hydraulic inputs and subsequently the monthly water balance does not resolve itself and cannot produce meaningful results for land application area sizing.

8n. General Conclusion

The majority of the properties/parcels within the locality have been assigned a High Sensitivity Rating to sustainable DWM. Predominantly, Detailed LCAs will be required, with all levels of LCA required to complete a site-specific design due to the higher rainfall associated with this region. System Sizing Tables were not generated for Lavers Hill and site-specific design is required for all properties/parcels that are located within Climate Zone 4, as per Figure 3 of the DWMP Technical Document, and System Sizing Tables cannot be used. 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.