PM DESIGN | GROUP
Engineering Solutions

Date: 25/02/2025

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Doc Rev: B

Land Capability Assessment

248 & 258 Mortlake-Ararat Road, MORTLAKE

MELBOURNE
GEELONG
BALLARAT
WARRNAMBOOL
HORSHAM
PORTLAND

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DOCUMENT REVISION SUMMARY

Revision	Date	Section	Description	Authorised
A	14/01/2025		Initial Report	PDR
B	25/02/2025	1.1, 4.1 & 6	Property boundaries changed as per POS	PDR

CONTENTS

1 INTRODUCTION

PM Design Group has been engaged to conduct a Land Capability Assessment (LCA) for lots 1 and 3 of proposed subdivision at 248 & 258 Mortlake-Ararat Road, Mortlake. A locality plan is shown in Figure 1.

The purpose of this report is to ensure that all on-site wastewater treatment is in accordance with both AS/NZS1547:2012 'On-Site Domestic Wastewater Management' and the VIC EPA 'Guideline for onsite wastewater management, May 2024' (GOWM).

The report will be submitted to the Moyne Shire Council and will accompany an application for an on-site wastewater management system.

Site and permeability evaluations were conducted by PM Design Group on 19/07/2024, and are summarised under Section 3.3 of this report. A full copy is available on request.

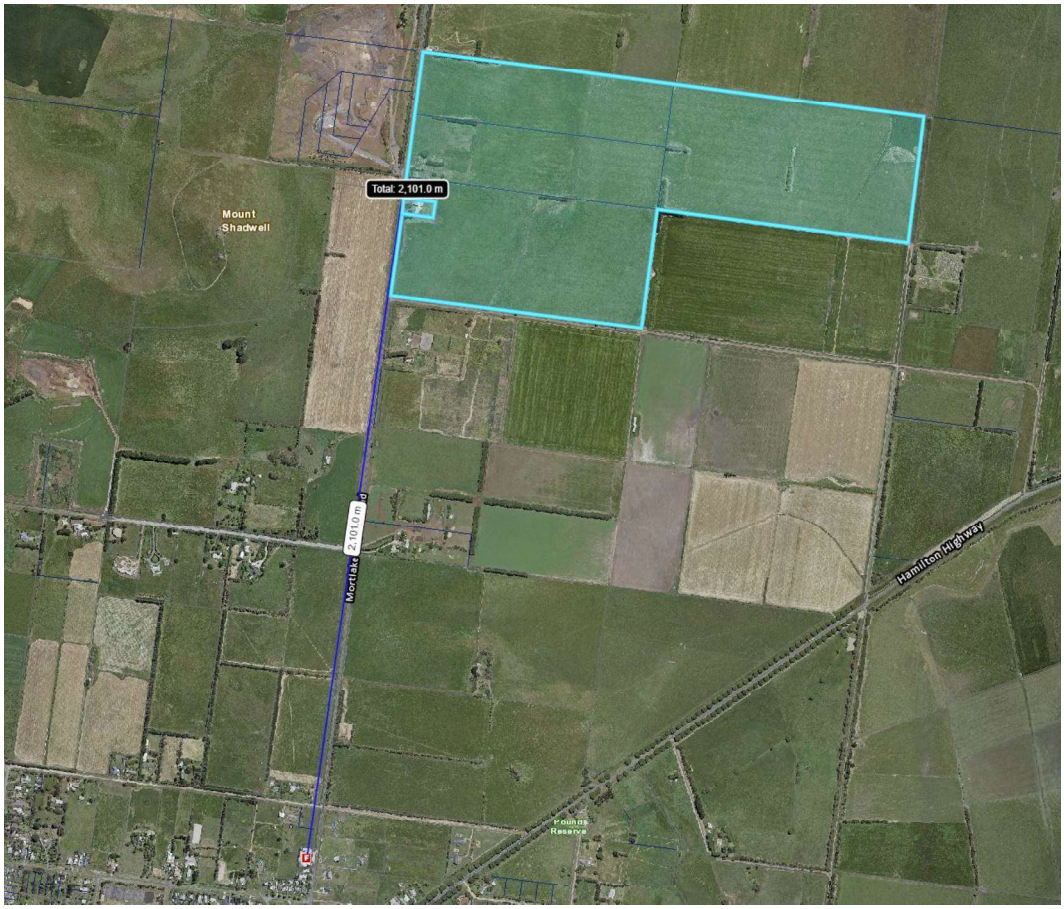

Figure 1 Location of property, approximately 2.1 km north of the Mortlake Fire Station.

1.1 Description of the Development

A brief summary description of the development is outlined in Table 1, and the proposed house plan is shown in Figure 2.

Table 1 Summary of proposed development.

Site Address:	248 & 258 Mortlake-Ararat Road, Mortlake
Owner / Developer:	[redacted]
Contact:	Company: Myers Planning & Associates Contact Name: [redacted] Ph: [redacted] Email: [redacted]
Council Area:	Moyne Shire Council
Council Domestic Wastewater Management Plan (DWMP) Property Assessment:	None at the time of writing. Minimum Treatment Standard: N/A
Allotment Size:	Proposed Lot 1: approx. 5.48 ha Proposed Lot 3: approx. 3,734 m²
Domestic Water Supply:	Reticulated water supply is not available. It is standard practice per GOWM to calculate daily loads based on the ready availability of water (onsite roof water tank supply) of 150 L/person/day.
Anticipated Wastewater Load:	***Proposed Lot 1:*** Existing residence with an existing primary treatment septic tank. The house drawing show a dwelling with 4 bedrooms, see Figure 2. The peak occupancy figure is calculated per clause 4.2.1, GOWM, based on the number of bedrooms = 4, plus other potentially habitable rooms = 0, plus one additional person. Design wastewater load is 150 L/person/day, thus the design load is 5 x 150 =750 L/day (sourced from Table 4-1 GOWM). ***Proposed Lot 3:*** Existing residence with an existing primary treatment septic tank. The house drawing show a dwelling with 3 bedrooms, see Figure 3. The peak occupancy figure is calculated per clause 4.2.1, GOWM, based on the number of bedrooms = 3, plus other potentially habitable rooms = 0, plus one additional person. Design wastewater load is 150 L/person/day, thus the design load is 4 x 150 =600 L/day (sourced from Table 4-1 GOWM).
Availability of Sewer:	The area is unsewered and unlikely to be sewered in the short to medium term future.

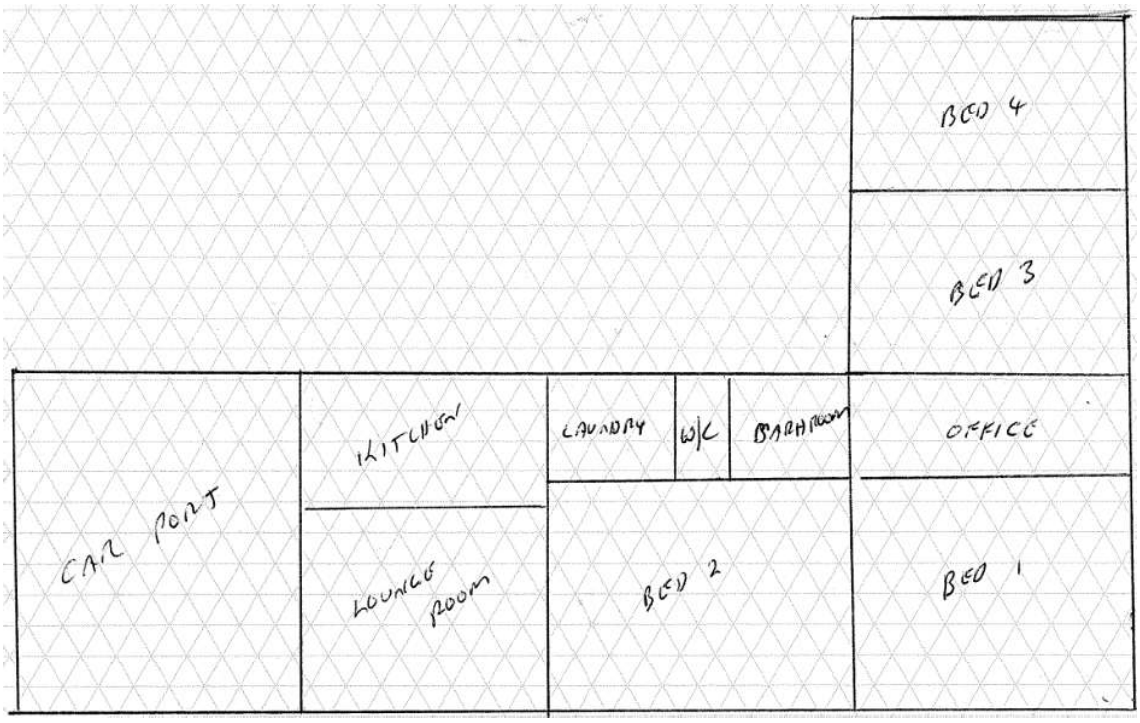

Figure 2 Image of existing house drawing on proposed Lot 1.

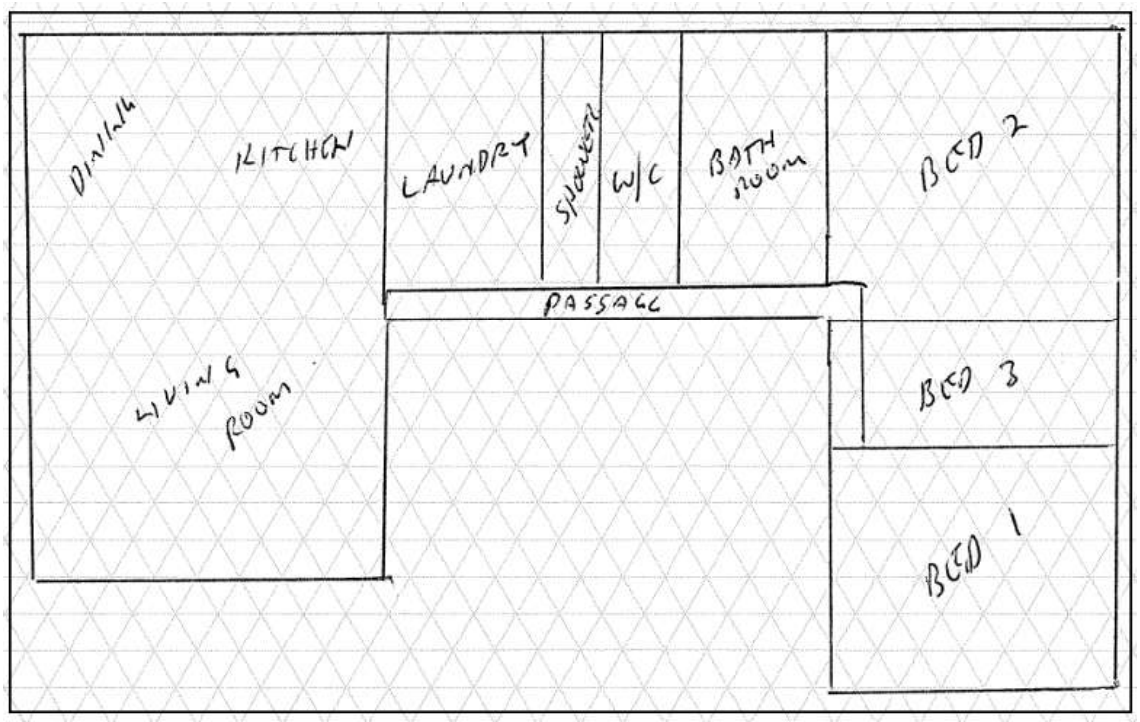

Figure 3 Image of existing house drawing on proposed Lot 3.

2 SITE EVALUATION

2.1 General

The property is located in a Farming Zone and is subject to both Aboriginal Cultural Heritage and Designated Bushfire Prone Area planning overlays.

2.2 Site Assessment

The site characteristics and key site features are listed in Table 2.

Table 2 Site characteristics and features.

Key Site Features	
Aspect	East.
Climate	The average annual rainfall for the area is 634 mm. The average annual potential evapotranspiration for the area is 1,287 mm. Data source: Data Drill Extracted from SILO on 11/07/2024 (Lat -38.05°, Long 142.80°).
Erosion & Landslip	No erosion has been observed. The likeliness of landslip issues is very unlikely.
Fill	Fill was not encountered.
Flooding	The existing effluent dispersal systems (EDS') do not appear to be subject to flooding.
Groundwater	The Visualising Victorian Groundwater Portal estimates groundwater to be 10 to 20 m below ground level.
Land Suitability	The sites are considered appropriate for use of an on-site wastewater system. The proposed lot 3 does fall within the category of a "small allotment" for an onsite wastewater system (< 4,000 m²).
Landform	Linear planar in the area of the EDS' and reserve fields.
Rock Outcrops	Nil identified.
Setback Distances	The required setback distances can be complied with.
Site Drainage	Drainage is expected to be good due to the soil profile.
Slope	The block slopes to the north at approx. 3% in the areas of the EDS'.
Surface Waters	A drainage line is located approx. 1.2 km to the east of the EDS'.
Vegetation	The areas of the EDS' currently have a moderate coverage of vegetation.

2.3 Site Risk Assessment

A site risk assessment based on the MAV (Municipal Association of Victoria) Model LCA Report (2006) is completed in Table 3.

Table 3 MAV Risk Assessment Table

Characteristic	Level of Constraint			Assessed Level of Constraint for Site	Proposed Mitigants/Notes
	Nil or Minor	Moderate	Major		
Aspect (affects solar radiation received)	N / NE NW	E / W / SE / SW	S	**Moderate**	Use of dispersal method which does not rely on evapotransporation as primary function.
Climate (difference between annual rainfall and pan evaporation)	Excess of evaporation over rainfall in the wettest months	Rainfall approximates to evaporation	Excess of rainfall over evaporation in the wettest months	**Moderate**	LAA to utilise appropriate systems to aid evapotranspiration.
Erosion (or potential for erosion)	Nil or minor	Moderate	Severe	**Minor**	
Exposure to sun and wind	Full sun and/or high wind or minimal shading	Dappled light	Limited patches of light and little wind to heavily shaded all day	**Minor**	
Fill (imported)	No fill or minimal fill, or fill is good quality topsoil	Moderate coverage and fill is good quality	Extensive poor quality fill and variable quality fill	**Minor**	
Flood frequency (ARI)	Less than 1 in 100 years	Between 100 and 20 years	More than 1 in 20 years	**Minor**	
Groundwater Bores	No bores onsite or on neighbouring properties	Setback distance from bore complies with requriements in GOWM	Setback distance does not comply with requirements in GOWM	**Moderate**	Required setback distances met
Land area available for EDS	Exceeds EDS and duplicate EDS and buffer distance requirements	Meets EDS and duplicate EDS and buffer distance requirements	Insufficient area for EDS	**Moderate**	Required setback distances met
Landslip (or landslip potential)	Nil	Minor to Moderate	High or Severe	**Minor**	
Rock outcrops (% of surface)	<10%	10-20%	>20%	**Minor**	
Slope Form (affects water shedding ability)	Convex or divergent side-slopes	Straight side-slopes	Concave or convergent side-slopes	**Moderate**	Stormwater from dwelling to be diverted away from LAA.

Characteristic	Level of Constraint					Assessed Level of Constraint for Site	Proposed Mitigants/Notes
	Nil or Minor		Moderate	Major			
Slope Gradient (%)							
(a) for trenches and beds	<6%		6-15%	>15%		**Minor**	
(b) for surface irrigation	<6%		6-10%	>10%		**N/A**	
(c) for sub-surface irrigation	<10%		10-30%	>30%		**N/A**	
Soil Drainage (qualitative)	No visible signs or likelihood of dampness, even in wet season		Some signs or likelihood of dampness	Wet soil, mositure loving plants, standing water in pit; water ponding on surface, soil pit fills with water		**Moderate**	Appropriate EDS sizing considered.
Stormwater run-on	Low likelihood of stormwater runon			High likelihood of inundation by stormwater run-on		**Minor**	
Surface waters – setback distance (m)	Setback distance complies with requirements in GOWM			Setback distance does not comply with requirements in GOWM		**Minor**	
Vegetation coverage over the site	Plentiful vegetation with healthy growth and good potential for nutrient uptake		Limited variety of vegetation	Sparse vegetation or no vegetation		**Moderate**	LAA to be planted with suitable vegetation to aid evapotranspiration.
Soil Drainage	Rapidly drained, Water removed from soil rapidly in relation to supply, excess water flows downward rapidly. No horizon remains wet for more than a few hours after addition	Well drained. Water removed from soil readily, excess flows downward. Some horizons may remain wet for several days after addition.	Moderately well drained. Water removed somewhat slowly in relation to supply, some horizons may remain wet for a week or more after addition.	Imperfectlly drained. Water removed very slowly in relation to supply, seasonal ponding, all horizons wet for periods of several months, some mottling	Poorly / Very poorly drained. Water remains at or near the surface for most of the year, strong gleying. All horizons wet for several months	**Moderate**	Appropriate EDS sizing considered.

3 SOIL EVALUATION

3.1 General

Study of the 1:250 000 geological map of Colac, see Figure 3, places the site on the area labelled Qvs1 which indicates Quaternary to Tertiary, Recent to Pliocene epoch Newer Volcanics - Scoria cones and agglutinated spatter rims: scoria, ash, lapilli, agglutinated lava spatter, volcanic bombs, minor lava flows and calcareous lithic fragments; massive to moderately bedded, poorly consolidated. It also boarders Qvh which indicates Quaternary, Plesitocene epoch Newer Volcanics - Stony rise basalt, hummocky lava flows; olivine basalt, highly vesicular.

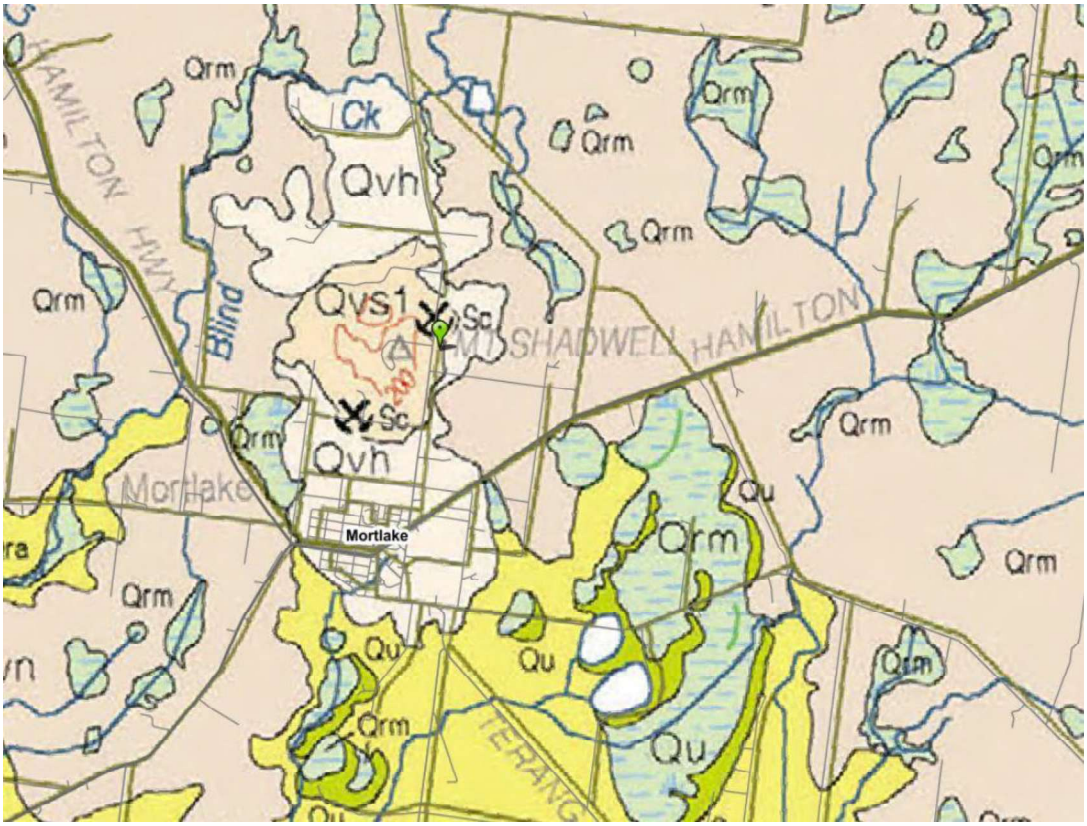

Figure 3 Image of the geological map showing the site (green pin) on the area of Qvs1/Qvh.

Geotechnical investigation of the site was conducted by PM Design on 19/07/2024. Boreholes were drilled by mechanical auger, and a percolation test was completed in the area proposed for the EDS. The soil was a dark brown silty sand topsoil, overlaying red clay and rock.

3.2 Soil Testing – Borehole Log

Soil classification bore(s) were completed in the vicinity of the existing EDS', and are shown in Table 4. The results are consistent with the soil types expected in this area, as per the geological maps.

Table 4 Soil classification log of bores drilled in the vicinity of the EDS

Test Hole No: **Proposed Lot 3**
Location: Location Rear of Existing Dwelling

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Depth mm	Unified Classification	Material Description	Colour	Consistency	Moisture Condition	Plasticity	Comments	Estimated Allowable Bearing Capacity (kPa)
0								
100		Silty Sand TOPSOIL	Dark Brown	Firm	Dry	Low		0-49
200								
300								
400								
500	Cl	CLAY	Red	Stiff	Dry	Med	*Water Added to penetrate	100
600								
700								
	Refusal	ROCK					Basalt	

Test Hole No: **Proposed Lot 1**
Location: Location Rear of Existing Dwelling

PM DESIGN GROUP Engineering Solutions

Depth mm	Unified Classification	Material Description	Colour	Consistency	Moisture Condition	Plasticity	Comments	Estimated Allowable Bearing Capacity (kPa)
0								
100		Silty Sand TOPSOIL	Dark Brown	Firm	Dry	Low	Some gravels	0-49
200								
300								
400								
500	Cl	CLAY	Brown / Red	Stiff	Dry	Med	*Water added to penetrate	100
600								
700								
	Refusal	ROCK					Basalt	100

3.3 Soil Category and Permeability

Proposed Lot 1:
The soil category based on borehole testing, and the percolation test undertaken as per Appendix G of AS/NZS 1547 (K_{sat} result = 1.17 m/d) was consistent with a high / moderate structured clay loam (4a) as per Table L1, AS/NZS 1547 . The indicative K_{sat} range for this classification is 0.50 - 1.50 m/d.

Proposed Lot 3:
The soil category based on borehole testing, and the percolation test undertaken as per Appendix G of AS/NZS 1547 (K_{sat} result = 1.37 m/d) was consistent with a high / moderate structured clay loam (4a) as per Table L1, AS/NZS 1547 . The indicative K_{sat} range for this classification is 0.50 - 1.50 m/d.

As per Table L1 of AS/NZS 1547, soil category 4a provides a number of options for wastewater management, ranging from; primary treated (septic tank) effluent with absorption beds or evapotranspiration absorption beds to secondary treated effluent (i.e. aerated treatment plant) with irrigation disposal. With a view of adopting a system with minimal ongoing maintenance, a **Design Loading Rate (DLR) of 10 mm/day** has been chosen from Table 4-8, GOWM as being appropriate for this soil category; for use with primary treatment dispersed to conventional effluent absorption beds in accordance with AS/NZS 1547:2012 Appendix L.

As noted in this report, the soil profile of the property may have limited topsoil (soil classification bores showing 700 mm), overlying rock. For the EDS to operate effectively, the minimum distance from the base of the absorption beds to any rock layer needs to be 600 mm. To achieve this, the length of each bed is to be probed, and if rock is encountered, the rock is to be removed and a suitable soil imported or won onsite to replace the void. If massive rock, i.e. cannot be excavated, is encountered the entire EDS soil profile shall be raised using imported or site-won soil to achieve the minimum soil depth of 600 mm below the beds.

4 TREATMENT SYSTEM DESIGN

4.1 General

The proposed lot 1 site is approx. 5.48 ha and lot 3 is approx. 3,734 m². Both proposed lots have adequate room for the respective EDS' observing all required offset distances.

4.2 Design Flow

Proposed Lot 1

Per EPA GOWM, dwellings with only tank water supply and standard water fittings are to be calculated as a design flow of 150 litres per person per day. Maximum occupancy has been assumed as 5 persons (4 bedrooms, plus 0 other possible habitable room(s), plus 1 additional person; per GOWM Clause 4.2.1).

Therefore, the design load, Q, for this site will be 5 x 150 = 750 Litres/day.

Proposed Lot 3

Per EPA GOWM, dwellings with only tank water supply and standard water fittings are to be calculated as a design flow of 150 litres per person per day. Maximum occupancy has been assumed as 4 persons (3 bedrooms, plus 0 other possible habitable room(s), plus 1 additional person; per GOWM Clause 4.2.1).

Therefore, the design load, Q, for this site will be 4 x 150 = 600 Litres/day.

4.3 Septic Tank Capacity

The minimum effective capacity of the septic tank has been calculated in accordance with Equations 1 and 2. It is noted that as per AS/NZS 1547 J3.2, the minimum operational capacity for an all-waste septic tank is recommended to be 3,000 L.

Proposed Lot 1

Equation 1 Septic Tank sizing calculation – minimum size.

$$(P1 \times S \times Y) + (P2 \times DF) = \min capacity$$

$$(5 \times 80 \times 3) + (5 \times\ 150) = 1{,}950\ litres$$

P1 & P2	=	5	(number of persons using the system)
S	=	80 L/p/y	(Rate of sludge/scum accumulation)
Y	=	3 years	(De-sludging frequency)
DF	=	150 L/p/d	(Daily flows)

With reference to AS/NZS 1547 Table J1 (Design flow < 1,000 L/day) it is recommended to install a minimum 3,000 L capacity septic tank for primary effluent treatment. The larger size allows for surge flows to be better dealt with by the system. The tank used shall be one certified by the EPA (Victoria).

Potential system configurations include;

- A conventional septic tank system of a minimum size of at least 3,000 L for primary treatment.
- Treated effluent from the primary treatment system is then pumped or fed by gravity to a suitably approved conventional absorption bed system.

Proposed Lot 3

Equation 2 Septic Tank sizing calculation – minimum size.

$$(P1 \times S \times Y) + (P2 \times DF) = \min capacity$$

$$(4 \times 80 \times 3) + (4 \times 150) = 1{,}560\ litres$$

P1 & P2	=	4	(number of persons using the system)
S	=	80 L/p/y	(Rate of sludge/scum accumulation)
Y	=	3 years	(De-sludging frequency)
DF	=	150 L/p/d	(Daily flows)

With reference to AS/NZS 1547 Table J1 (Design flow < 1,000 L/day) it is recommended to install a minimum 3,000 L capacity septic tank for primary effluent treatment. The larger size allows for surge flows to be better dealt with by the system. The tank used shall be one certified by the EPA (Victoria).

Potential system configurations include;

- A conventional septic tank system of a minimum size of at least 3,000 L for primary treatment.
- Treated effluent from the primary treatment system is then pumped or fed by gravity to a suitably approved conventional absorption bed system.

4.4 Trench and or Bed Dimensions

Proposed Lot 1

Total trench and or bed length shall be determined as per the AS/NZS 1547 appendix L4.2, as shown in Equation 3.

Equation 3 Trench / bed length calculation

$$L = {}^{Q}/_{(DLR \times W)}$$

$$L = {}^{750}/_{(10 \times 1.2)}$$

$$L \approx 62.5\ m$$

Based on the calculated total of 50 m bed length, and not significantly exceeding a recommended bed length of 20 m, it is proposed to use 3/No. 17 m long x 1.2 m wide conventional absorption beds as per AS/NZS1547 (detail provided in Site Plans).

Table 5 Proposed Bed Dimensions

Bed dimensions	**Range**
Length	3/No. @ 21 m
Width	1.2 m
Depth of aggregate (bed)	0.3 m (min)
Depth of topsoil	0.15 m
Spacing between adjacent beds and extent of beds	1 m

Proposed Lot 3

Total trench and or bed length shall be determined as per the AS/NZS 1547 appendix L4.2, as shown in Equation 4.

Equation 4 Trench / bed length calculation

$$L = {}^{Q}/_{(DLR \times W)}$$
$$L = {}^{600}/_{(10 \times 1.2)}$$
$$L \approx 50\ m$$

Based on the calculated total of 50 m bed length, it is proposed to use 3/No. 17 m long x 1.2 m wide conventional absorption beds as per AS/NZS1547 (detail provided in Site Plans).

Table 6 Proposed Bed Dimensions

Bed dimensions	**Range**
Length	3/No. @ 17 m
Width	1.2 m
Depth of aggregate (bed)	0.3 m (min)
Depth of topsoil	0.15 m
Spacing between adjacent beds and extent of beds	1 m

4.5 Effluent Dispersal System Sizing Calculations

Proposed Lot 1

The minimum EDS required to adequately accommodate the beds minimum spacing is 5.6 m wide x 21 m long, an area of 117.6 m^2 allowing for a 1 metre spacing the beds.

In accordance with AS/NZS 1547, and to future-proof the system, a duplicate reserve field shall be allowed for on the site. There is adequate space on the site to provide for this duplicate field.

Please refer to the attached plans for the designated effluent dispersal system and reserve field.

Proposed Lot 3

The minimum EDS required to adequately accommodate the beds minimum spacing is 5.6 m wide x 17 m long, an area of 95.2 m^2 allowing for a 1 metre spacing the beds.

In accordance with AS/NZS 1547, and to future-proof the system, a duplicate reserve field shall be allowed for on the site. There is adequate space on the site to provide for this duplicate field.

Please refer to the attached plans for the designated effluent dispersal system and reserve field.

4.6 Distribution

Treated effluent shall be piped from the outlet of the treatment system to a distribution sump pit via pump or gravity. A distribution pit shall be installed to ensure the flow is evenly distributed.

The effluent shall be distributed through to conventional absorption beds. The beds shall be constructed in accordance with AS/NZS 1547:2012 Appendix L, as shown in the attached plan. In summary, the beds are to be lined with geotextile, with slotted pipe installed central to each bed. Clean, no-fines 20-40 mm gravel (aggregate) is to be used to back fill over the pipe and bed. Aggregate chosen should be suitable for purpose – that is, not rapidly break down when exposed to moisture. A layer of geofabric shall be used to separate the aggregate from the topsoil layer. It is best practice for the base of the bed to be constructed with a slope down away from the head of the bed at approximately a drop of 2 mm every 3 m.

4.7 Siting the Effluent Dispersal System (EDS)

An indicative layout plan for the EDS' are attached to this report. Siting is to be completed as below:

- The beds are best constructed along the contour of the land, allowing the base of the bed to be constructed level (with a very slight fall away from the head of the bed) to ensure even distribution of the dosed effluent.
- The EDS' should be sited so that it is exposed to both prevailing winds and direct sunlight. Existing plants and shrubs just outside the perimeter of the EDS will assist with evapotranspiration of the effluent.
- The EDS' should never be subject to vehicular or stock traffic and should include signage to this effect. Fencing or landscaping the EDS to further discourage vehicle or stock traffic is recommended.

Siting of the EDS' may be varied with approval from the Local Government bodies issuing the wastewater permit.

4.8 Buffer distances

Buffer distances from EDS' are required to help prevent human contact, maintain public amenity and protect sensitive environments.

For primary treatment, as proposed at this location, the following buffers / setback distances are stipulated in Table 4-10 of GOWM.

- 20 m from potable or non-potable groundwater bores (for category 2b to 6 soils);
- 60 m from watercourses and dams that are non-potable;
- 100 m from watercourses in a potable water supply catchment;
- 6 m up-gradient and 3 m down-gradient of property boundaries and buildings;
- 15 m from cutting / escarpment;
- 1.5 m from highest seasonal water table;
- 6 m from in ground swimming pools; and
- 3 m from service pipes, e.g. water pipe, gas pipe.

The site is sufficiently large to cater for all the required buffers.

4.9 Stormwater control

The Effluent dispersal systems do not appear to be at risk of significant further hydraulic loading from surface water flow from the adjacent areas. If deemed otherwise, the EDS' can be protected from rainfall runoff by constructing cut off drains in accordance with AS 1547 to divert water from the EDS'.

Overflow pipes from rainwater tanks provided on site for potable and fire water supplies, and any other downpipes from the dwelling or surface water from driveways shall be directed away from the EDS'.

4.10 Maintenance

Maintenance of the system should generally occur in accordance with Section 6.3 of AS1547:2012. As a minimum, the treatment system should:

- Be regularly maintained in accordance with the manufacturer's instructions and maintenance schedule;
- Be de-sludged every 3 years or in accordance with EPA, Council or manufacturer's instructions, whichever is more frequent;
- Be protected from stock and vehicles;
- Have grease traps cleaned out regularly;
- Keep the vent and/or access cover accessible;
- Have any outlet filter inspected and cleaned as per manufacturer's instructions.

4.11 Vegetation

Vegetation of the Effluent dispersal systems should be undertaken to assist in evapotranspiration of the treated effluent. Grasses and plants which are tolerant of high salt and high nutrient content, and which thrive in an environment where roots are kept constantly wet should be considered. It may be best to contact a local landscaper with experience in such planting, and the local climate, in considering appropriate varieties for this site.

5 CONCLUSION

Having completed the soil investigation and classification, and taking into consideration all other relevant information the following recommendations are made;

Proposed Lot 1:

- Decommission the existing septic tanks and dispersal field.
- Installation of a minimum size 3,000 L capacity septic tank system for primary treatment dispersed to 3/No. 21 m long x 1.2 m wide conventional effluent absorption beds in accordance with AS/NZS 1547:2012 Appendix L.
- The treated effluent is dispersed by gravity to the EDS as outlined.

Proposed Lot 3:

- A licenced plumber is to confirm to the satisfaction of council the existing septic is EPA approved, has a minimum capacity of 3,000 L and is in good working order. If not, a new EPA approved septic tank with minimum capacity of 3,000 L shall be installed for primary treatment.
- The treated effluent is dispersed by gravity to the EDS as outlined, being a minimum of 3/No. 17 m long x 1.2 m wide conventional effluent absorption beds in accordance with AS/NZS 1547:2012 Appendix L.

Note: Advice by the owner is there are 2/No. existing 26 m long x 1.2 m wide absorption trenches. If a licenced plumber can confirm the existing trenches are currently in good working order, council may accept the continued usage in lieu of installing the new trenches as outlined in this report.

Both Lots:

- A distribution sump pit shall be installed to ensure even distribution of the treated effluent across the beds.
- Reserve EDS areas shall be set aside for future requirements if/when the original EDS' fails.
- Tanks should be serviced and maintained in accordance with manufacturer instructions or Moyne Shire Council's requirements, whichever is more frequent.
- Where sludge is accumulated in a septic tank, the pump-out frequency shall be every 3 years, as a minimum, and more often dependent upon usage.
- Vegetation of the Effluent dispersal systems with suitable plants as per section 4.11.
- It is suggested that signage be placed on the EDS' and sinks/appliances outlining chemicals and cleaning products that are not suitable for use with the relevant treatment system, or as per system manufacturer and installer advice.
- Signage is to be installed to indicate that the EDS' are not to be subject vehicle traffic or stock movement. It is suggested that fencing or landscaping be incorporated to prevent vehicle access to the EDS, and any mowing should be undertaken using nothing heavier than a ride-on lawn mower. Tractors or industrial mowers shall not be used over the EDS as damage to the absorption beds is considered likely.
- A detailed design plan of the wastewater management system has been attached to this report.

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6 APPENDIX A

Groundwater estimated to be 10-20 m below ground level, from Visualising Victoria Groundwater website.

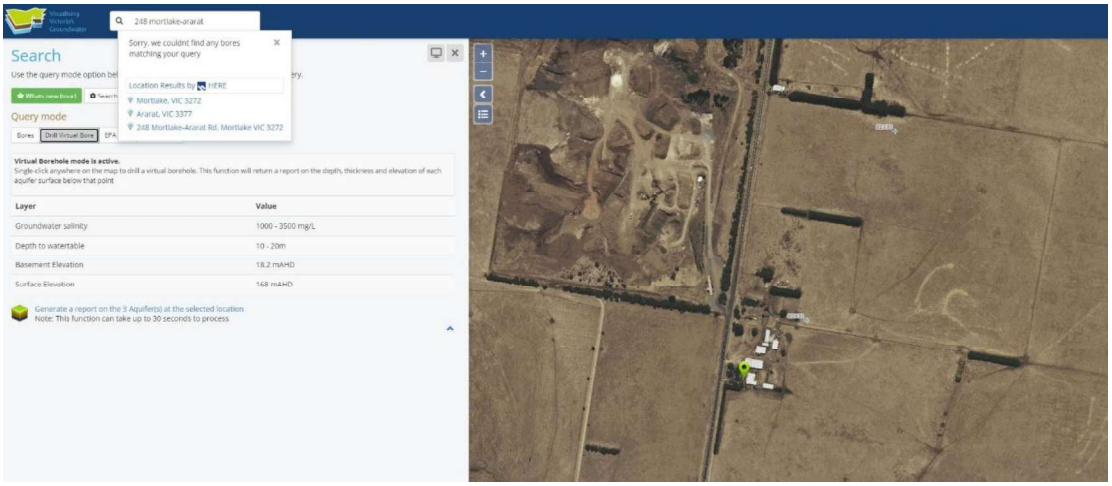
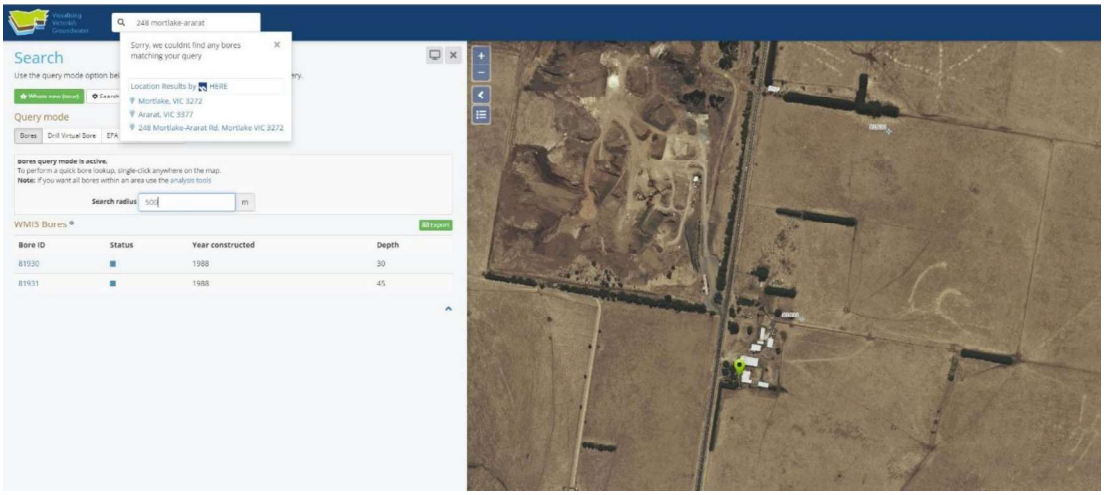
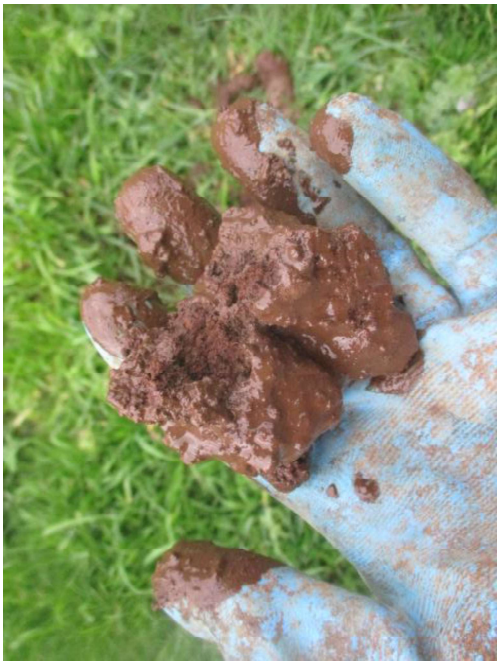


Image showing groundwater bores (Visualising Victoria Groundwater website) well beyond the area of the proposed EDS (blue box).



Images of soil from the investigation bores.



CONSTRUCTION GUIDE

PRE-CONSTRUCTION CONSIDERATIONS

SERVICES LOCATION

IT IS RECOMMENDED THAT A SERVICES LOCATION CHECK BE PERFORMED TO ENSURE THAT CONSTRUCTION WORKS WILL NOT IMPACT ON UNDERGROUND SERVICES SUCH AS WATER, GAS, POWER, & COMMUNICATIONS.

VEGETATION REMOVAL

UNDERTAKE VEGETATION REMOVAL IN ACCORDANCE WITH THE APPROVED DESIGN HAVING REGARD TO A VEGETATION REMOVAL APPROVAL THAT MAY BE REQUIRED FROM THE LOCAL COUNCIL. (AS/NZS 1547 SECTION 6)

SOIL IMPROVEMENT & CIVIL WORKS

UNDERTAKE SOIL IMPROVEMENT & CIVIL WORKS IN ACCORDANCE WITH THE APPROVED DESIGN. ARRANGE INSPECTION BY THE LOCAL COUNCIL OR DESIGNER IF REQUIRED TO DO SO. (AS/NZS 1547 SECTION 6)

WEATHER

THE WEATHER CONDITIONS SHOULD BE CONSIDERED PRIOR TO COMMENCEMENT OF CIVIL WORKS. EXCAVATION WORK DURING POOR WEATHER CONDITIONS CAN RESULT IN UNNECESSARY DAMAGE TO THE EDS & WORK SITE.

SEDIMENT & EROSION CONTROL

EVALUATE POTENTIAL FOR SEDIMENT & EROSION IMPACTS ASSOCIATED WITH THE WORK SITE & IMPLEMENT SUITABLE CONTROL MEASURES AS REQUIRED.

EDS DESIGN CHANGES

ALTERATION TO THE DESIGN OF THE EFFLUENT DISPERSAL SYSTEM MUST BE APPROVED BY THE DESIGNER & THE LOCAL COUNCIL. (AS/NZS 1547 M7.2, T5.2.2)

CONSTRUCTION CONSIDERATIONS

SITE PROTECTION & PREPARATION

EXCAVATIONS SHOULD ONLY TAKE PLACE DURING FINE WEATHER & AVOID EXCAVATION WHEN THE SOIL HAS A MOISTURE CONTENT ABOVE THE PLASTIC LIMIT. IF RAIN IS FORECAST THEN COVER ANY OPEN TRENCHES, TO PROTECT THEM FROM RAIN DAMAGE. SMEARED SOIL SURFACES CAN BE IMPROVED BY 'RAKING' TO REINSTATE A MORE NATURAL SOIL SURFACE. AVOID COMPACTION BY KEEPING PEOPLE OFF THE FINISHED TRENCH OR BED FLOOR. EXCAVATE PERPENDICULAR TO THE LINE OF FALL OR PARALLEL TO THE CONTOUR OF SLOPING GROUND & ENSURE THAT THE INVERTS ARE HORIZONTAL. (AS/NZS 1547, L7)

PIPEWORK

PIPES & FITTINGS MUST:

- COMPLY WITH AS2439.2, AS2698.2, AS/NZS4129, AS/NZS413 OR AS/NZS1477.
- BE AN APPROVED TYPE OF SYSTEM, MATERIAL, DIAMETER, PERFORATION SIZE, SPACING & LOCATION. DISTRIBUTION PIPE SHALL BE SLOTTED OR DRILLED OF A SUITABLE SIZE & NUMBER. PRE-FORMED ARCHES SHALL BE SLOTTED ALONG THE LOWER PORTION OF THE ARCH. (AS/NZS 1547 L8, L6.1.2, L6.1.3)

GRAVEL

DISTRIBUTION AGGREGATE SHOULD BE CAREFULLY PLACED INTO THE BEDS TO AVOID DAMAGE TO THE BASE, SIDEWALLS & ARCH SYSTEM. GRAVEL IS GENERALLY CLEAN 20 - 40 MM AGGREGATE. (AS/NZS 1547 L7.3)

FILTER CLOTH (GEOTEXTILE FABRIC)

FILTER CLOTH CAN BE A SYNTHETIC NON-WOVEN POLYESTER FABRIC SUITABLE FOR CIVIL CONSTRUCTION. A TYPICAL FABRIC GRADE IS A12 (120 GSM) WHICH HAS A PORE SIZE (095) OF 130 MM. NOTE: FILTER CLOTH SHOULD NOT BE PLACED BENEATH DISTRIBUTION PIPES/ARCHES AS IT CAN FORM A CLOGGING LAYER. (AS/NZS 1547 N3.3.6)

TOPSOIL COVER

BEDS MUST NOT BE COVERED WITH AN IMPERMEABLE LAYER. SOIL COVER IS GENERALLY 150 MM UNLESS OTHERWISE STATED IN THE DESIGN. (AS/NZS 1547 L7.3)

VEGETATION

A SUITABLE GRASS COVER SHOULD BE ESTABLISHED AS SOON AS POSSIBLE AFTER COMPLETION OF CONSTRUCTION WORKS. THE VEGETATION SHOULD BE MAINTAINED & CAREFULLY IRRIGATED UNTIL ESTABLISHED. (AS/NZ 1557, L3)

UPSLOPE SURFACE WATER/SUBSURFACE CONTROLS

CONSTRUCT SURFACE WATER &/OR SUBSURFACE DIVERSION DRAINS UPSLOPE OF THE BEDS WHERE THERE IS POTENTIAL FOR WATER IMPACTS. (AS 1547 L5.4)

MARKING

THE PRESENCE OF BURIED PIPES SHALL:

- BE INDICATED, FOR EXAMPLE, USING UNDERGROUND MARKING TAPE TO AS/NZS 2648.1; OR
- BE INDICATED BY SIGNAGE, PROMINENTLY DISPLAYED WITH THE WORDS: 'SEWAGE EFFLUENT PIPEWORK INSTALLED BELOW. DO NOT DIG.'

CHECKS & INSPECTIONS'

COMMENCEMENT OF WORKS

PRIOR TO COMMENCEMENT OF ANY WORKS, ENSURE WORKS ARE APPROVED & COPY OF COUNCILS PERMIT IS AVAILABLE.

VEGETATION REMOVAL

ENSURE NECESSARY APPROVALS FOR VEGETATION REMOVAL HAVE BEEN OBTAINED & A COPY OF THE APPROVAL IS AVAILABLE. ARRANGE INSPECTIONS AS REQUIRED IN ACCORDANCE WITH APPROVAL.

SITE CIVIL WORKS

ENSURE NECESSARY APPROVALS FOR PROPOSED SITE WORKS HAVE BEEN OBTAINED & A COPY OF THE APPROVAL IS AVAILABLE. ARRANGE INSPECTIONS IN ACCORDANCE WITH PERMIT OR OTHER APPROVALS.

SOIL IMPROVEMENT WORKS

ARRANGE INSPECTIONS IN ACCORDANCE WITH PERMIT.

CONSTRUCTION STAGE

CHECK THAT THE LOCATION & DIMENSIONS OF THE EDS ALIGNS WITH THE PERMIT & APPROVED SITE PLAN.

VERIFY THAT THE TYPE & CAPACITY OF PUMP IS AS DESIGNED (IF INSTALLED).

PERFORM A HYDRAULIC CHECK ON PUMPED SYSTEMS BY OPERATING THE PUMP. THIS IS TO DETERMINE EFFECTIVE OPERATION, COMPLIANCE WITH HYDRAULIC SPECIFICATIONS & TO DETECT ANY LEAKS IN JOINTS & CONNECTIONS (REFER PRE-COMMISSIONING CHECKS BELOW). IF A PERMANENT POWER SUPPLY IS NOT AVAILABLE, A TEMPORARY SUPPLY MAY BE REQUIRED.

POST CONSTRUCTION

ARRANGE INSPECTIONS IN ACCORDANCE WITH PERMIT OR OTHER APPROVAL.

COMMISSIONING GUIDE

PRE-COMMISSIONING

CHECK THAT INSPECTIONS OF THE EDS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE PERMIT CONDITIONS. (AS/NZS 1547 6.2.5)

IF PUMP(S) ARE PART OF THE SYSTEM, AS/NZS 1547 ADVISES THAT THE FOLLOWING PRE-COMMISSIONING TESTS ARE TO BE CARRIED OUT AFTER ALL ON-SITE COMPONENTS, INCLUDING THE PUMP, HAVE BEEN INSTALLED, BUT PRIOR TO COVERING LATERALS (SEE ALSO AS/NZS1547 6.2.5).
AS A MINIMUM THE TEST SHALL TAKE THE FOLLOWING STEPS:

- FILL THE PUMP CHAMBER TO 'PUMP-ON' LEVEL WITH WATER
- START THE PUMP
- CHECKING THE PIPEWORK FOR LEAKS.
- TESTING THE HIGH-WATER LEVEL ALARM.
- FOLLOW PUMP MANUFACTURER'S RECOMMENDATIONS FOR COMMISSIONING PUMP (AS/NZS 1547 APPENDIX L, L10)

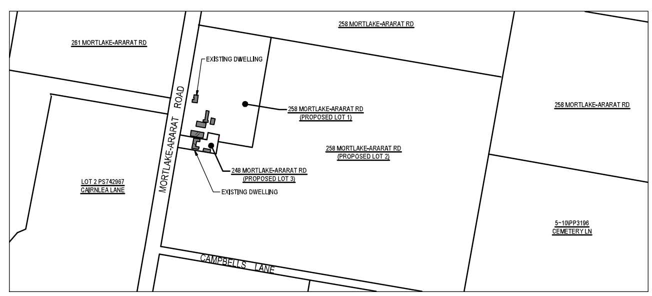
COMMISSIONING

AS/NZS 1547 ADVISES THAT THE ON-SITE SYSTEM SHALL BE INSPECTED, CHECKED, & COMMISSIONED ACCORDING TO 6.2.5

VERIFY THAT CONSTRUCTION OF THE EDS ALIGNS WITH THE PERMIT CONDITIONS & THE APPROVED DESIGN.

COMPLETE INSPECTION & COMMISSIONING REQUIREMENTS IN ACCORDANCE WITH THE PERMIT CONDITIONS.

PROVIDE COPIES OF THE INSPECTION & COMMISSIONING REPORTS TO THE PROPERTY OWNER & LOCAL COUNCIL. (AS/NZS 1547 APPENDIX L, L11)



LOCALITY PLAN
SCALE 1:5 000

REV	DATE	BY	APP	REVISION DESCRIPTION
B	25.02.2025	TJG	PDR	PROPERTY BOUNDARIES MOVED AS PER PROPOSED POS.
A	15.01.2025	TJG	PDR	ISSUED FOR APPROVAL

N/A
SCALE @ A1

ENGINEER	PDR
DESIGNER	TJG
DRAWN	TJG
CHECKED	CDW
APPROVED	PDR

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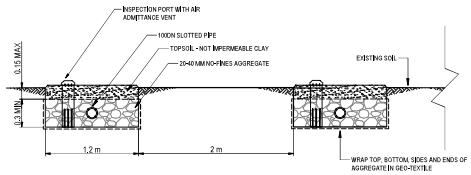
WEB: www.pmdesign.com.au

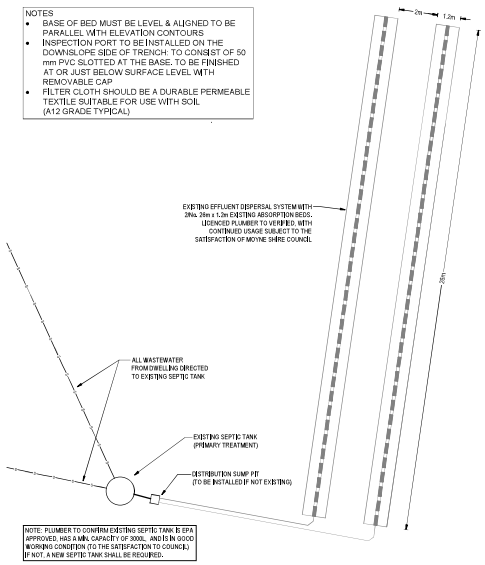
PROJECT: 248 & 258 MORTLAKE-ARARAT RD, MORTLAKE
PM PROJECT No. : 18431
CLIENT: MYERS PLANNING AND ASSOCIATES (R.EDWARDS)
DWG No. : C010
TITLE : GENERAL NOTES AND LOCALITY PLAN
C:\USERS\TRAVISGREENE\PM DESIGN PTY LTD\PMD - 18431_248 & 258 MORTLAKE - ARARAT RD, MORTLAKE\LCA\18431 LCA.DWG
REV: B



ABSORPTION TRENCH DETAIL

SCALE 1:25

NOTES
- BASE OF BED MUST BE LEVEL & ALIGNED TO BE PARALLEL WITH ELEVATION CONTOURS
- INSPECTION PORT TO BE INSTALLED ON THE DOWNSLOPE SIDE OF TRENCH. TO CONSIST OF 50 mm PVC SLOTTED AT THE BASE. TO BE FINISHED AT OR JUST BELOW SURFACE LEVEL WITH REMOVABLE CAP
- FILTER CLOTH SHOULD BE A DURABLE PERMEABLE TEXTILE SUITABLE FOR USE WITH SOIL (A12 GRADE TYPICAL)



LAND APPLICATION AREA DETAIL

SCALE 1:100

SCALE 5 0 5 10 1:250

SCALE @ A1

REV	DATE	BY	APP	REVISION DESCRIPTION
B	25.07.2025	TJG	PDR	PROPERTY BOUNDARIES MOVED AT PER PROPOSED PDL
A	16.01.2025	TJG	PDR	ISSUED FOR APPROVAL

REV	DATE	BY	APP	REVISION DESCRIPTION	REV	DATE	BY	APP	REVISION DESCRIPTION

ENGINEER	PDR
DESIGNER	TJG
DRAWN	TJG
CHECKED	CDW
APPROVED	PDR

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PROJECT: 248 & 258 MORTLAKE-ARARAT RD, MORTLAKE

PM PROJECT No. : 18431

CLIENT: MYERS PLANNING AND ASSOCIATES (R.EDWARDS)

DWG No. : C011

TITLE : WASTEWATER MANAGEMENT SYSTEM - PROPOSED LOT 3

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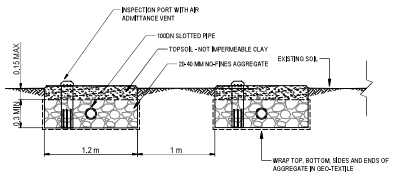

ABSORPTION TRENCH DETAIL

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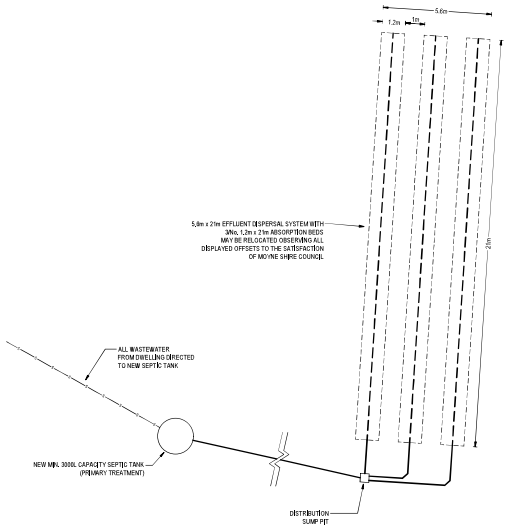

LAND APPLICATION AREA DETAIL

SCALE 1:100

SCALE 5 0 5 10 1:250

SCALE @ A1

REV	DATE	BY	APP	REVISION DESCRIPTION
B	25.07.2025	TJG	PDR	PROPERTY BOUNDARIES MOVED AT PER PROPOSED PDS.
A	16.01.2025	TJG	PDR	ISSUED FOR APPROVAL

REV	DATE	BY	APP	REVISION DESCRIPTION

ENGINEER	PDR
DESIGNER	TJG
DRAWN	TJG
CHECKED	CDW
APPROVED	PDR

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PROJECT: 248 & 258 MORTLAKE-ARARAT RD, MORTLAKE

PM PROJECT No. : 18431

CLIENT: MYERS PLANNING AND ASSOCIATES (R.EDWARDS)

DWG No. : C012

TITLE : WASTEWATER MANAGEMENT SYSTEM - PROPOSED LOT 1

C:\USERS\TRAVIS\GREENE\PM DESIGN PTY LTD\PMD - 18431_248 & 258 MORTLAKE - ARARAT RD, MORTLAKE\LCA\18431 LCA.DWG

REV: B