

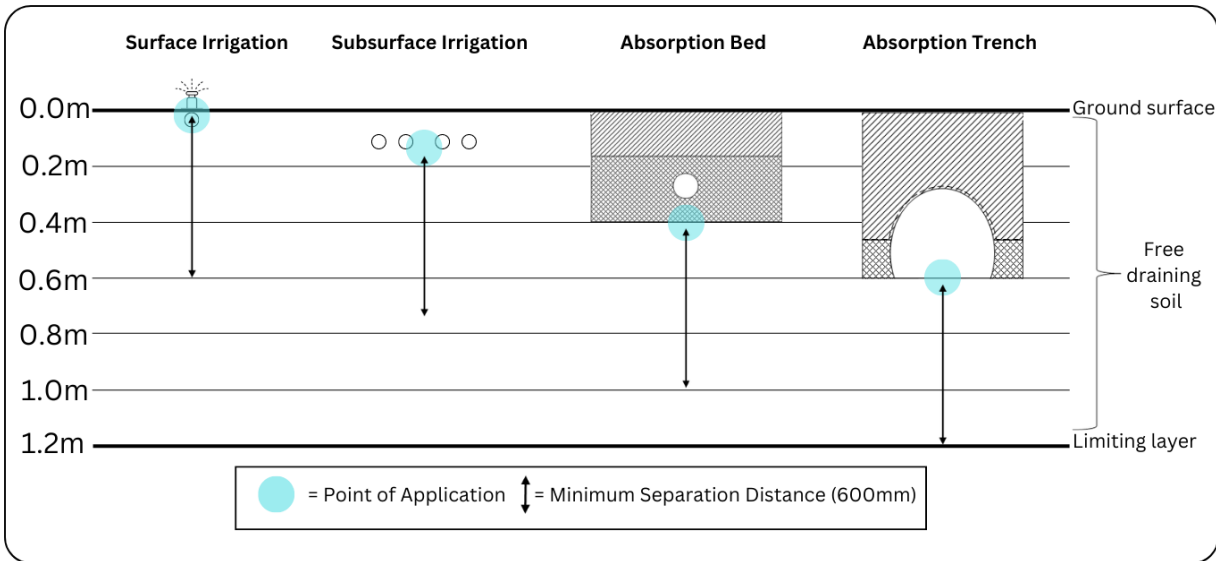
SITE ASSESSMENT AND DESIGN EXERCISE

Prior to commencing, it is important that we understand the relevance of the soil information gathered in the field, and how to interpret that information and successfully apply the methodology outlined in GOWM and EDRS (EPA VIC, 2024) and VLCAF (MAV 2014) to determine:

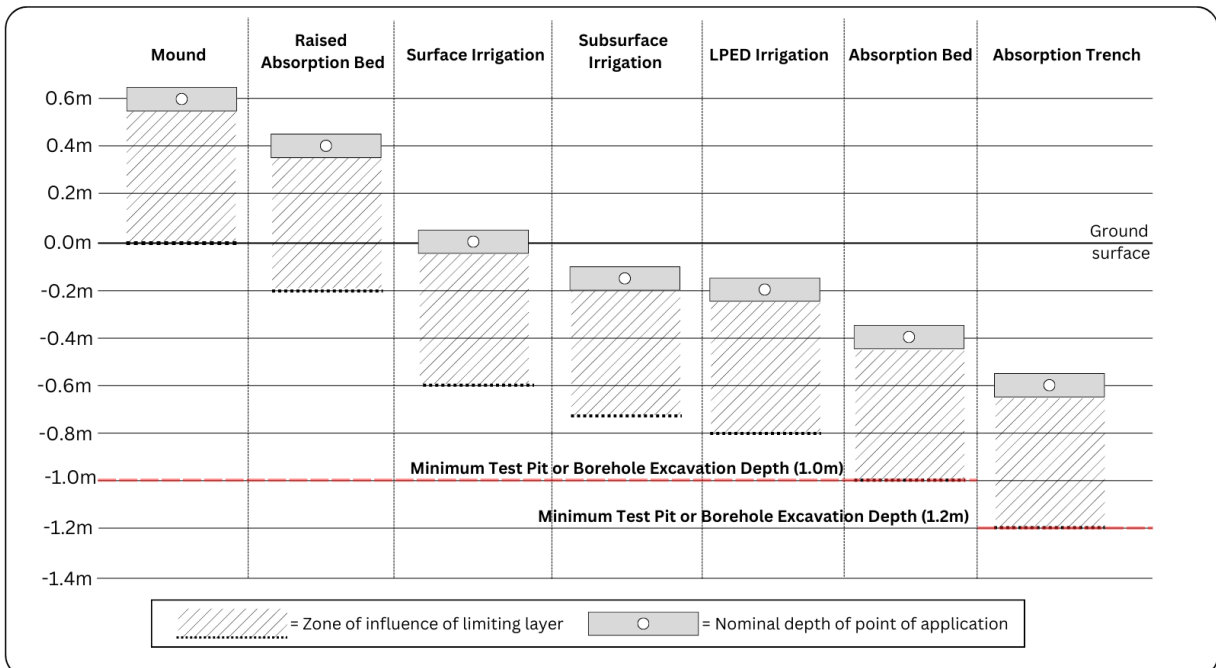
1. The most-limiting horizon (or constraint) within the 'zone of influence' for the chosen effluent application system, and
2. The appropriate soil loading rate (SLR) for the observed characteristics of the limiting horizon.

To achieve this, we must understand two (2) important concepts.

Point of Application (POA) – The point at which treated effluent is applied to the soil. This is the level of the emitters in an irrigation system or the base of a bed or trench system.



Separation distance – The 'vertical' separation between the point of application and a limiting horizon. The separation distance between the point of application and the limiting horizon (or constraint) should be a minimum of 0.6 metre.
















For this exercise we will work in small groups to complete a site assessment and design exercise for an on-site wastewater system.

Step One – Interpreting the Soil Log

- (i) A ‘typical’ soil borehole log is provided below, along with a photograph of the excavated core. As seen, the core has been drilled to a depth of 1.2m and three (3) soil ‘horizons’ are identified.

On the log, mark the point of application and show the minimum separation distance for the following effluent application systems: (a) primary absorption trench; (b) ETA bed; (c) Wisconsin sand mound and (d) irrigation system.

Note how different application systems intercept with the observed soil horizons and how selection of an appropriate ‘limiting constraint’ is guided by the POA.

SOIL BORE LOG															
Client:		Mr & Mrs Dirt			Test Pit No:		BH2								
Site:		Somewhere up the back			Excavated/logged by:										
Date:		Yesterday			Excavation type:		Shovel, auger & crowbar								
Notes:		- refer to site plan for position of test pit													
PROFILE DESCRIPTION															
Depth (m)	Graphic Log	Horizon	Texture	Structure	Colour	Mottles	Coarse Fragments	Moisture Condition	Photo Log	Identify the POA and required separation distance for each of the following LAA types				Depth (m)	
										Trench	ETA/Bed	Sand Mound	Irrigation		
														0.6	
														0.5	
														0.4	
														0.3	
														0.2	
														0.1	
0.1		A1	SL	Moderate	Dark brown	No	2 - 10% 2-6mm	SM						-0.1	
0.2															-0.2
0.3		A2	SCL	Moderate	Dark greyish brown	No	2 - 10% 2-6mm	SM							-0.3
0.4															-0.4
0.5															-0.5
0.6							2 - 10%	D							-0.6
0.7		B	LC	Strong	Strong brown	Red and Orange (moderate)	6-20mm	D							-0.7
0.8															-0.8
0.9															-0.9
1.0															-1.0
1.1						Minor gley									-1.1
1.2															-1.2
1.3														-1.3	

Step Two – Preliminary LAA Sizing

EDRS (EPA, 2024) supports a simple hydraulic equation methodology for effluent dispersal system sizing based on an ‘areal loading’ rate calculation.

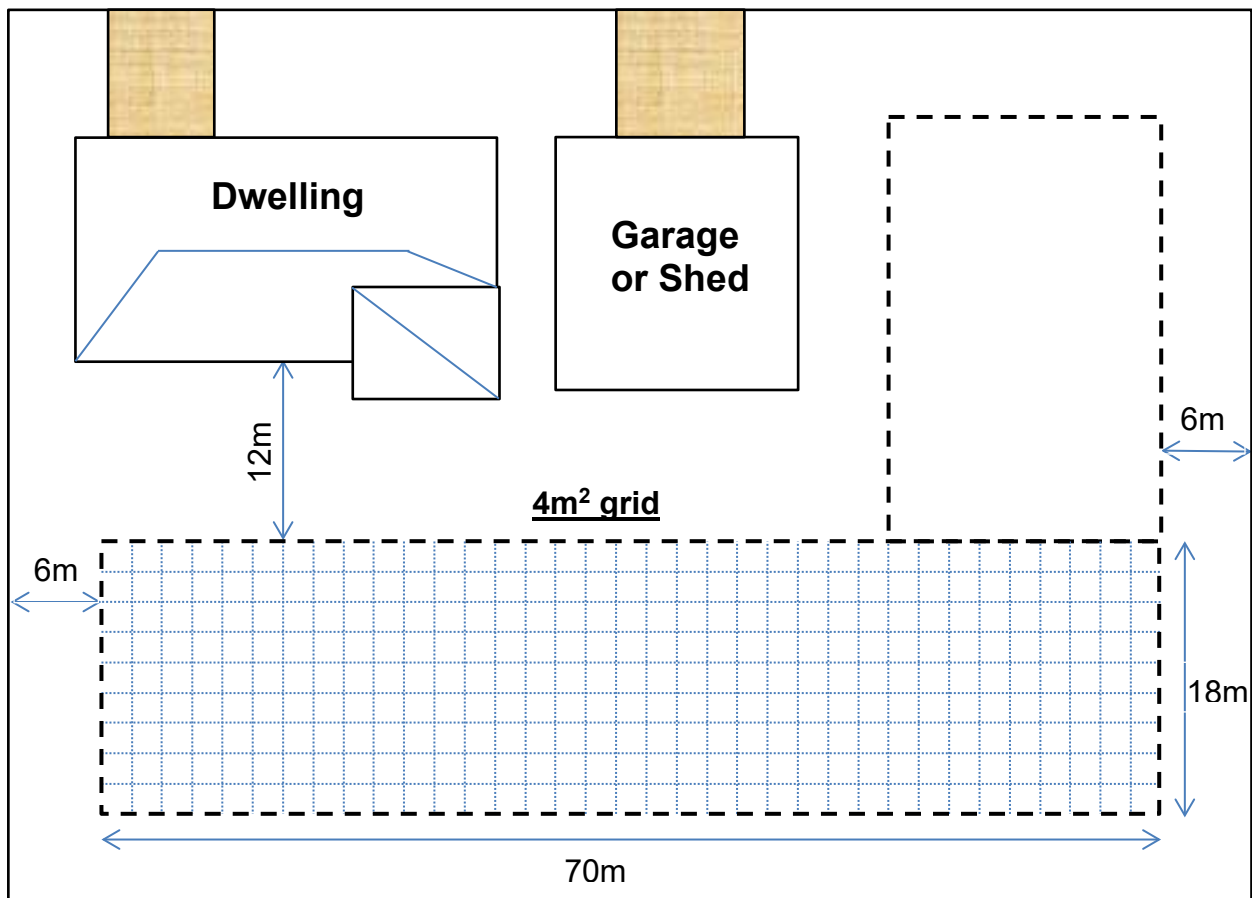
$$A \text{ (m}^2\text{)} = Q \text{ (L)} / \text{soil loading rate (DLR, DIR, BLR) (mm/day)}$$

Assume that you are designing an OWM system for a new dwelling to be constructed on the Site, with reticulated water supply, and a design hydraulic load of **600L/day**.

- (ii) To examine the relative land area requirements for a range of EDS, use Tables 4.8 and 4.9 from GOWM (EPA, 2024) (see following pages) to determine the applicable (soil) loading rate and minimum system area required for each of the following EDS types, based on the ‘limiting’ soil condition from the soil log provided in Step 1.

LAA System Type	Loading Rate (mm/day)	Minimum Size (m²)
Absorption Trench/bed		
ETA bed		
Mound		
Irrigation area		

- (iii) On the example Site Plan (below), sketch out how each LAA configuration might be arranged for this example Site.



Step Three - Fieldwork

Use the **Soil Survey Sheet** and **Appendix 2** (following pages) to record details of **your** site and soil assessment.

Auger a hole and lay the soil out carefully to represent the observed soil profile. Excavate a soil pit adjacent to the auger hole and note how much additional detail in the soil profile can be obtained by digging a soil pit.

Use the skills you have learned earlier to assess the soil texture by hand and feel for each horizon (layer) you can distinguish in the soil profile. Compile this information and the results of the other soils investigations listed on the table (Soil Survey Sheet).

- (iv) What is the **'texture and structure'** of the most-limiting soil horizon or constraint in the identified effluent land application area (LAA)?
-

Remember: Minimum vertical separation to limiting condition is 0.6m (GOWM; Table 4-10).

- (v) Would it be possible to mitigate the limiting condition identified for an EDS design? If so, how might you do that?
-

Step Four – Design Conditions

Assume that you are designing an OWM system for a **three-bedroom** dwelling and detached **one-bedroom** studio on the Site you have just investigated. Reticulated (town) water supply and 'standard' water fixtures will be provided.

- (vi) What is the **'design occupancy'** for each of the buildings?
-

- (vii) What is the **total occupancy (EP)** for the development, and on what basis have you made this determination?
-

- (viii) Calculate the **'design daily flow'** for the OWMS design using Table 4-3 of GOWM (EPA,2024)?
-

TABLE H1
TYPICAL DOMESTIC WASTEWATER DESIGN FLOW ALLOWANCES – AUSTRALIA

Source	Typical wastewater design flows (L/person/day)	
	On-site roof water tank supply	Reticulated water supply
Residential premises	120	150

Source: Australian Bureau of Statistics. Water Account 2004/2005. Chapter 7 Figure 7.3

Table 4-3: Example calculations for household wastewater generation

Water supply	Household fixtures	Number of bedrooms	Number of people ⁸	Design flow rate (L/person/day)	Daily wastewater volume (L/day) ⁹
Reticulated	Standard water fixtures	4	5	180	900
Reticulated	Standard water fixtures	2	3	180	540
Reticulated	Water-reduction fixtures	4	5	150	750
Reticulated	Water-reduction fixtures	2	3	150	450
Onsite roof water tank	Standard water fixtures	4	5	150	750

(Source: GOWM EPA VIC 2024)

Table 4-4: Minimum daily wastewater flow rates and organic loading rates – community/commercial premises¹⁰

Source	Design hydraulic flow rates for all water supplies (L/person/day)	Organic material loading design rates (g BOD/person/day)
Motels/hotels/guesthouse		
Bar trade per customer	7	8
Bar meals per diner	10	10
Per resident guest and staff with in-house laundry	150	80
Per resident guest and staff with outsourced laundry	100	80
Restaurants (per potential diner)¹¹		
Premises <50 seats	40	50
Premises >50 seats	30	40
Tearooms, cafés (light refreshments and prepared food (e.g. cakes, etc.) per seat	10	10
Conference facilities per seat	25	30
Function centre per seat	30	35
Take-away food shop per customer	10	40
Public areas (with toilet, but no showers and no café)¹²		
Public toilets	6	3
Theatres, art galleries, museums	3	2
Meeting halls with kitchenette	10	5
Premises with showers and toilets		
Golf clubs, gyms, pools etc. (per person)	50	10
Hospitals – per bed	350	150
Shops/shopping centres		
Per employee	15	10
Public access	5	3
School – childcare		
Per day pupil and staff	20	20
Resident staff and boarders	150	80
Factories, offices, day training centres,		

¹⁰ Based on EPA Publication 500: Code of Practice for Small Wastewater Treatment Plants.

¹¹ Number of seats multiplied by the number of seatings, i.e., may include multiple seatings for breakfast, morning and afternoon teas, lunch and dinner.

¹² For premises such as public areas, factories or offices with showers and toilets, use the flow rates for 'Premises with showers and toilets' in the calculations.

(Source: GOWM EPA VIC 2024)

Step Five – Performance-based Design Solution

- (ix) Discuss amongst your group and decide upon the **'most suitable'** OWMS combination for the Site layout (below) and the soil conditions you have assessed today.

Treatment System: (Primary / Secondary), Why? _____

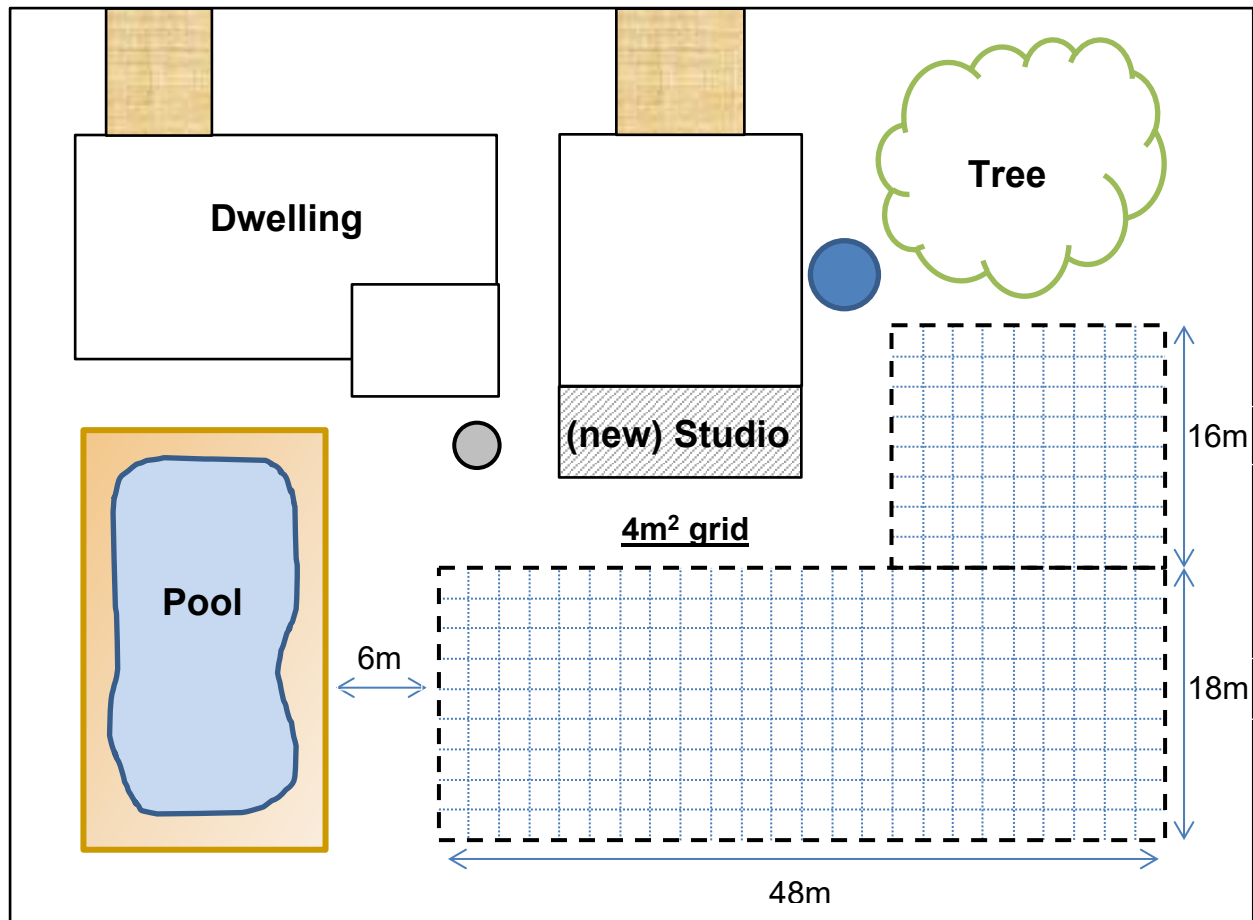
EDS type: _____

Applicable (Design) Soil Loading Rate: (mm/day) _____

Mitigation proposed: (What/Why?) _____

- (x) Prepare a case to justify your OWMS selection and determine the appropriate sizing and arrangement for your system on the following development Site.

LAA required (m²): _____



Each group will have an opportunity to present their design and will be expected to explain / rationalise how they have reached their conclusions.

Table 4-8: Soil categories and design loading/irrigation rates (reproduced from AS1547:2012 with permission by Standards Australia)

Soil texture	Soil structure	Soil category	Indicative soil permeability Ksat (m/d)	Design irrigation rates (DIR)/design loading rates (DLR) (mm/day)						
				Absorption trenches/ beds			ETA trenches/ beds	Subsurface and surface irrigation	LPED irrigation	Mounds (basal area)
				Table L1, AS/NZS 1547:2012		Table L1, AS/NZS 1547:2012	Table M1, AS/NZS 1547:2012	Table M1, AS/NZS 1547:2012	Table N1, AS/NZS 1547:2012	
Primary treated effluent		Secondary treated effluent								
Conservative rate	Maximum rate									
Gravels and sands	Structureless (massive)	1	>3.0	See Note 1 of Table L1, AS/NZS 1547:2012 for DLR values			See Note 4 of Table L1, AS/NZS1547:2012	5 (See Note 1 of Table M1, AS/NZS 1547:2012)	See Note 3 of Table M1, AS/NZS154:2012)	32
Sandy loams	Weakly structured	2a	>3.0					5	4	24
	Massive	2b	1.4–3.0	15	25	50		(See Note 1 Table M1, AS/NZS 1547:2012)	4	24
Loams	Highly/moderately structured	3a	1.5–3.0	15	25	50		4	3.5	24
	Weakly structured or massive	3b	0.5–1.5	10	15	30		4	3.5	16
Clay loams	Highly/moderately structured	4a	0.5–1.5	10	15	30	12	3.5	3	16
	Weakly structured	4b	0.12–0.5	6	10	20	8	3.5	3	8
	Massive	4c	0.06–0.12	4	5	10	5	3.5	3	5 (See Note

Soil texture	Soil structure	Soil category	Indicative soil permeability Ksat (m/d)	Design irrigation rates (DIR)/design loading rates (DLR) (mm/day)						
				Absorption trenches/ beds			ETA trenches/ beds	Subsurface and surface irrigation	LPED irrigation	Mounds (basal area)
				Table L1, AS/NZS 1547:2012		Table L1, AS/NZS 1547:2012	Table M1, AS/NZS 1547:2012	Table M1, AS/NZS 1547:2012	Table N1, AS/NZS 1547:2012	
Primary treated effluent		Secondary treated effluent								
Conservative rate	Maximum rate									
Light clays	Strongly structured	5a	0.12–0.5	5	8	12	8	3	2.5	8
	Moderately structured	5b	0.06–0.12		5	10	5	3	(See Note 4 of Table M1, AS/NZS1547:2012)	5 (See Note of Table N1 AS/NZS 1547:2012)
	Weakly structured or massive	5c	<0.06			8	(See Note 2, 3 5 of Table L1 AS/NZS 1547:2012)	(See Note 1 of Table M1, AS/NZS1547:2012)	12	1547:2012)
Medium to heavy clays	Strongly structured	6a	0.06–0.5	(See Notes 2 and 3 of Table L1 AS/NZS1547:2012)			Table L1 AS/NZS 1547:2012)	2	(See Note 3 of Table M1, AS/NZS1547:2012)	
	Moderately structured	6b	<0.06				1547:2012)	(See Note 2 of Table M1, AS/NZS1547:2012)	12	
	Weakly structured or massive	6c	<0.06							

(Source: GOWM EPA VIC 2024)

Table 4-9: Soil categories and design loading/irrigation rates recommended for Victoria

Soil texture	Soil structure	Soil category	Design irrigation rates (DIR)/design loading rates (DLR) (mm/day)				
			Absorption trenches/ beds	ETA trenches/ beds	Subsurface and surface irrigation	LPED irrigation	Mounds (basal area)
			Table L1, AS/NZS 1547:2012	Table L1, AS/NZS 1547:2012	Table M1, AS/NZS 1547:2012	Table M1, AS/NZS 1547:2012	Table N1, AS/NZS 1547:2012
Gravels and sands	Structureless (massive)	1	Recommended to use values from "conservative rate" column of Table 4-8 See also Note 1, 2 and 3 of Table 4-9	ETA/ETS systems are not normally used on soil categories 1 and 2a. 15	Refer to values and notes in Table 4-8 See also Note 4 of Table 4-9	LPED irrigation is not suitable on soil categories 1 and 2a	Refer to values and notes in Table 4-8
Sandy loams	Weakly structured	2a					
	Massive	2b					
Loams	Highly/moderately structured	3a	Refer to values and notes in Table 4-8			Refer to values and notes in Table 4-8	
	Weakly structured or massive	3b					
Clay loams	Highly/moderately structured	4a					
	Weakly structured	4b					
	Massive	4c					

Soil texture	Soil structure	Soil category	Design irrigation rates (DIR)/design loading rates (DLR) (mm/day)				
			Absorption trenches/ beds	ETA trenches/ beds	Subsurface and surface irrigation	LPED irrigation	Mounds (basal area)
			Table L1, AS/NZS 1547:2012	Table L1, AS/NZS 1547:2012	Table M1, AS/NZS 1547:2012	Table M1, AS/NZS 1547:2012	Table N1, AS/NZS 1547:2012
Light clays	Strongly structured	5a					
	Moderately structured	5b					
	Weakly structured or massive	5c					
Medium to heavy clays	Strongly structured	6a				LPED irrigation is not suitable on soil category 6	
	Moderately structured	6b					
	Weakly structured or massive	6c					

Notes to Table 4-9:

1. There is elevated risk associated with primary treated effluent being dispersed to trenches and beds in soil categories 1 and 2a. This is due to the high infiltration rate of these soils, which leads to uneven distribution along the base of the trench. These soils have low nutrient retention capacities, often allowing accession of nutrients to groundwater.
2. Use of absorption trenches/beds in category 1 and 2a soils require design by a suitably qualified and experienced person. Where groundwater quality is at risk, secondary treatment is required and consideration should also be given to disinfection, nutrient removal, soil modification or distribution over a large application area.
3. Use of absorption trenches/beds in category 5b, 5c and 6 soils requires special design and distribution techniques or soil modification procedures. In most situations the design will need to rely on more processes than just absorption by the soil.
4. The design irrigation rate for subsurface or surface irrigation may be increased in sandy soils (categories 1 and 2) where secondary treatment is installed with disinfection and nutrient reduction.

(Source: GOWM EPA VIC 2024)

**TABLE L1
RECOMMENDED DESIGN LOADING RATES FOR TRENCHES AND BEDS**

Soil category	Soil texture	Structure	Indicative permeability (K_{sat})(m/d)	Design loading rate (DLR) (mm/d)			ETA/ETS beds and trenches
				Trenches and beds		Secondary treated effluent	
				Primary treated effluent			
				Conservative rate	Maximum rate		
1	Gravels and sands	Structureless (massive)	> 3.0	20 (see Note 1)	35 (see Note 1)	50 (see Note 1)	(see Note 4)
2	Sandy loams	Weakly structured	> 3.0	20 (see Note 1)	30 (see Note 1)	50 (see Note 1)	
		Massive	1.4 – 3.0	15	25	50	
3	Loams	High/moderate structured	1.5 – 3.0	15	25	50	
		Weakly structured or massive	0.5 – 1.5	10	15	30	
4	Clay loams	High/moderate structured	0.5 – 1.5	10	15	30	
		Weakly structured	0.12 – 0.5	6	10	20	8
		Massive	0.06 – 0.12	4	5	10	5
5	Light clays	Strongly structured	0.12 – 0.5	5	8	12	8
		Moderately structured	0.06 – 0.12	(see Notes 2 & 3)	5	10	5 (see Notes 2, 3, & 5)
		Weakly structured or massive	< 0.06		8		
6	Medium to heavy clays	Strongly structured	0.06 – 0.5		(see Notes 2 & 3)	5 (see Notes 2, 3, & 5)	
		Moderately structured	< 0.06				
		Weakly structured or massive	< 0.06				

NOTES:

- The treatment capacity of the soil and not the hydraulic capacity of the soil or the growth of the clogging layer govern the effluent loading rate in Category 1 and weakly structured Category 2 soils. Land application systems in these soils require design by a suitably qualified and experienced person, and distribution techniques to help achieve even distribution of effluent over the full design surface (see L6.2 and Figure L4 for recommended discharge method by discharge control trench). These soils have low nutrient retention capacities, often allowing accession of nutrients to groundwater.
- To enable use of such soils for on-site wastewater land application systems, special design requirements and distribution techniques or soil modification procedures will be necessary. For any system designed for these soils, the effluent absorption rate shall be based upon soil permeability testing. Specialist soils advice and special design techniques will be required for clay dominated soils having dispersive (sodic) or shrink/swell behaviour. Such soils shall be treated as Category 6 soils. In most situations, the design will need to rely on more processes than just absorption by the soil.
- If $K_{sat} < 0.06$ m/d, a full water balance for the land application can be used to calculate trench/bed size (see Appendix Q).
- ETA/ETS systems are not normally used on soil Categories 1 to 3.
- For Category 6 soils ETA/ETS systems are suitable only for use with secondary treated effluent.

(Source: AS/NZS 1547:2012 Standards Australia)

**TABLE M1
RECOMMENDED DESIGN IRRIGATION RATE (DIR) FOR IRRIGATION SYSTEMS**

Soil Category (see Note 1)	Soil texture	Structure	Indicative permeability (K_{sat}) (m/d)	Design irrigation rate (DIR) (mm/day)		
				Drip irrigation	Spray irrigation	LPED irrigation
1	Gravels and sands	Structureless (massive)	> 3.0	5 (see Note 2)	5	(see Note 3)
2	Sandy loams	Weakly structured massive	> 3.0 1.4 – 3.0			4
3	Loams	High/ moderate structured	1.5 – 3.0	4 (see Note 1)	4	3.5
		Weakly structured or massive	0.5 – 1.5			
4	Clay loams	High/ moderate structured	0.5 – 1.5	3.5 (see Note 1)	3.5	3
		Weakly structured	0.12 – 0.5			
		Massive	0.06 – 0.12			
5	Light clays	Strongly structured	0.12 – 0.5	3 (see Note 1)	3	2.5 (see Note 4)
		Moderately structured	0.06 – 0.12			
		Weakly structured or massive	< 0.06			
6	Medium to heavy clays	Strongly structured	0.06 – 0.5	2 (see Note 2)	2	(see Note 3)
		Moderately structured	< 0.06			
		Weakly structured or massive	< 0.06			

NOTES:

- For Category 3 to 5 soils (loams to light clays), the drip irrigation system needs to be installed in an adequate depth of topsoil (in the order of 150 – 250 mm of *in situ* or imported good quality topsoil) to slow the soakage and assist with nutrient reduction.
- For Category 1, 2, and 6 soils, the drip irrigation system has a depth of 100 – 150 mm in good quality topsoil (see CM1 and M3.1).
- LPED irrigation is not advised for Category 1 or Category 6 soils – drip irrigation of secondary effluent is the preferred irrigation method.
- LPED irrigation for Category 5 soils needs a minimum depth of 250 mm of good quality topsoil (see M5 and CM7.1).

(Source: AS/NZS 1547:2012 Standards Australia)

**TABLE N1
RECOMMENDED MOUND DESIGN LOADING RATES**

Soil Category	Soil texture	Structure	Indicative permeability (K_{sat})(m/d)	Design loading rate (DLR) (mm/d)
1	Gravels and sands	Structureless (massive)	> 3.0	32
2	Sandy loams	Weakly structured	> 3.0	24
		Massive	1.4 – 3.0	24
3	Loams	High/ moderate structured	1.5 – 3.0	24
		Weakly structured or massive	0.5 – 1.5	16
4	Clay loams	High/ moderate structured	0.5 – 1.5	16
		Weakly structured	0.12 – 0.5	8
		Massive	0.06 – 0.12	5 (see Note)
5	Light clays	Strongly structured	0.12 – 0.5	8
		Moderately structured	0.06 – 0.12	5 (see Note)
		Weakly structured or massive	< 0.06	
6	Medium to heavy clays	Strongly structured	0.06 – 0.5	5 (see Note)
		Moderately structured	< 0.06	
		Weakly structured or massive	< 0.06	

NOTE: To enable use of such soils for on-site wastewater land application, special design requirements and distribution techniques or soil modification procedures will be necessary. For any system designed for these soils, the effluent absorption rate shall be based upon soil permeability testing. Specialist soils advice and special design techniques will be required for clay dominated soils having dispersive (sodic) or shrink/swell behaviour. Such soils shall be treated as Category 6 soils. In most situations, the design will need to rely on more processes than just absorption by the soil.

(Source: AS/NZS 1547:2012 Standards Australia)

Appendix 1. Model site report

1.0 Site Evaluator(s)	
Name:	
Company/ Agency:	
Address:	
Tel:	
E-mail:	
Date:	

2.0 Site Information (Desktop evaluation)	
Site address:	
Local Government Area:	Lot/ DP:
Client/ Owner/ Developer:	
Address:	
Tel:	
Email:	
Site Description (General):	
Area of lot, LEP zoning, location in landscape, topography, slope, buildings, services and neighbouring properties uses:	
Proposed Development (new or renovated buildings/ planned improvements):	
Map name and scale (topographic/ orthophoto):	
Site Plan and photograph(s) of site and soils:	
Are the following features marked on Site Plan:	
Location of OWMS components (treatment tank, plumbing, EAA) and any existing OWMS components:	
Waterways, drainage lines and dams:	
Stands of trees/ shrubs:	
Bores/ wells:	
Buildings/ driveways/ pools/ fences (existing and proposed):	
Other sensitive receptors:	

North arrow, scale, slope (gradient and direction), lot boundaries, borehole locations, buffers to sensitive receptors:
Available EAA and excluded areas:
2.1 Geology (from geological map)
2.2 Soil Landscape (from soil landscape map)
2.3 Climate:
Data source:
Average annual rainfall: mm
Average annual evaporation: mm
Intensity/ seasonal variation:
2.4 Intended water supply source and design flows
Reticulated Roof collection of rainwater Bore/ well/ dam back-up
Water saving devices (confirm star rating): None 3-star 4-star or greater
Number of bedrooms:
Total design water use (derived per bedroom) (L/day):
2.5 Existing local onsite systems
Common neighbouring system:
Typical performance/ problems evident:
2.6 Discuss owner preference:
2.7 Registered groundwater bores within 100m (use/ details):
2.8 Sensitive receptors in local area (drinking water catchment/ vulnerable environments/ aquaculture/ food crops):
2.9 Hazard mapping (flood potential/ bushfire/ acid sulphate soils/ geotechnical hazards):

3.0 Site Evaluation	
Date:	
Weather on day of site evaluation:	
Weather in week preceding site evaluation:	
3.1 Existing OSMS type/ condition/ dimensions/ capacity (if any):	
Existing treatment tank/s (septic/ AWTS/ GT):	
Existing EAA (type/ condition/ size/ layout)	
3.2 Site characteristics and limitations (at EAA)	
Slope (gradient (%) and direction):	
Topographic position of EAA/ landform:	
Ground cover/ vegetation:	
Exposure – aspect/ shading	
Surface and subsurface drainage (flow paths towards waterways/ sensitive features)	
Run-on and seepage:	
Erosion potential (slope/ soil erosivity/ exposure):	
Fill (presence/ stability):	
Surface rocks (presence/ proximity):	
Sensitive receptors:	
3.3 Previous use of EAA and degree of soil disturbance:	
Fill, compaction, contamination:	
3.4 Site stability:	
Expert assessment required: Yes/ No	
If yes, attach slope stability report and risk assessment	
3.5 Photograph of EAA attached: Yes/ No	

4.0 Soil Assessment (One sheet required for each soil test pit or borehole)

Client:		Date:	
Lot Number:	D.P.:	Grid reference:	
Location of test pits or boreholes to be marked on site plan (plan attached)		GPS reference coordinates	
Borehole number:			
Slope:	Landscape position:	Parent material:	
AHD (m):	Surface condition:	Vegetation:	
Indicative surface drainage:		Indicative subsurface drainage:	
Depth to bedrock/ hard pan (m):			
Layer	Lower depth mm	Layer	Depth to soil watertable (seasonal/ permanent) (m):
		Colour (moist) & mottles	Moisture
		Field texture	Structure
			Soil category#
			Sample I.D.
			Indicative permeability (mm/day)
			Coarse Fragments
			Other Comments
1			
2			
3			
4			
4.1 Additional field/ laboratory test results (as applicable)			
		Layer 1	Layer 2
			Layer 3
			Layer 4
pH: (1:5 soil:water)			
Electrical conductivity (dS/m) (1:5 soil:water)			
Emerson class (EAT)			
Exchangeable sodium percentage (%)			
Phosphorus sorption capacity (mg/kg)			

Other					
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Notes

- Only the first part of the Emerson Aggregate test is required
- Soil Category refers to soil textures as outlined in Table 4-6

5.0 General comments

5.1 Environmental and health issues of significance identified in site and soil assessment (moderate and major limitation) and mitigation measures proposed to offset limitations:

Feature	Limitation identified	Mitigation measures

5.2 Buffer distances available to:

Feature	Required buffer (m)	Available buffer (m)
Permanent watercourse (river, creek, lake):		
Intermittent watercourse (gully, drainage line, dam):		
Groundwater bore/ well		
Site boundaries:		
Buildings:		
Recreation areas (pool):		
In-ground water tank:		
Retaining wall/ embankment:		
Groundwater:		
Hardpan/ bedrock:		
Sensitive receptors:		

5.3 Land area available (site size - constrained areas) (m²):

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5.4 System selection

Consideration of connection to centralised sewerage system/ distance:

Type of treatment system(s) best suited to site:

Rationale:

Type of effluent application option(s) best suited to site:

Rationale:

Recommended design loading rate: Design wastewater loading: litres per day (from 2.4) Design loading rate: litres per square metre per day
Rationale:
Total land area required for system and effluent application option:
Is there sufficient EAA for the system selected? Yes/ No
Is there sufficient land area for additional/ reserve EAA? Yes/ No
If so, what additional EAA is available? m ²
5.5 Other comments/ special design considerations required:

