

DOYLE **SOIL** **CONSULTING**



SITE AND SOIL EVALUATION REPORT ONSITE WASTEWATER ASSESSMENT

**3575, Lot 2, Channel Highway
Woodbridge**

November 2025

**ATTENTION:
Printed Copies of this report must be printed in colour, and in full.
No responsibility is otherwise taken for its contents**

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SITE INFORMATION

Client: Robert and Maree Jones

Address: 3575, Lot 2, Channel Highway, Woodbridge (CT 15437/2)

Site Area: Approximately 820 m²

Date of inspection: 24/09/2025

Building type: New 3-bedroom house

Services: Tank water supply and onsite wastewater management

Relevant Planning Overlays: Waterway and coastal protection area along SE boundary

Mapped Geology - Mineral Resources Tasmania 1:250 000 SE sheet: **Jd** = Jurassic Dolerite

Soil Depth: 0.7 – 0.9 m

Subsoil Drainage: Poorly/Imperfectly/Moderately-well/Well drained

Drainage lines/water courses: D'Entrecasteaux Channel 45 m east

Vegetation: pasture and native trees

Rainfall in previous 7 days: Approximately 36 mm

Slope: Approximately 7° SE

SITE ASSESSMENT AND SAMPLE TESTING

Site and soil assessment in accordance with AS1547-2012 *Onsite domestic wastewater assessment and design*.

Emerson Dispersion test on subsoils.

Test holes were dug using a Christie Post Driver Soil Sampling Kit, comprising CHPD78 Christie Post Driver with Soil Sampling Tube (50 mm OD x 1600/2100 mm).

SITE AND SOIL COMMENTS

The natural soil profiles are formed from clayey colluvium derived from Jurassic dolerite. The profiles are moderately shallow with weathered dolerite bedrock at approximately 0.7 m depth.

For land application purposes, the soil profiles are limited by light clays, which are weakly structured and moderately dispersive.

Site constraints

- Dispersive light clay (Cat. 5) subsoils
- Shallow soil profiles – bedrock at approx. 0.7 m depth
- Moderately slope angles of 7° at proposed LAA

The site, soil and planning constraints shall be addressed by installing an accredited aerated wastewater treatment system (AWTS) with disinfection and land application via subsurface irrigation (SSI). SSI system should be installed within a raised and retained irrigation area. Landscaping of the irrigation area shall reduce the surface slope to approximately 10% (5.3°) so that a DLR of 3 mm/day is permitted (per Table M2 of AS/NZS 1547:2012).

Since the SSI system is to be installed within a raised and retained irrigation area, the installation of the irrigation lines will therefore have little/no impact on the root zone of any high conservation value trees, if found to be present within the proposed land application area.

As part of the plumbing application, the applicant must provide the certificate of accreditation for the specific AWTS to be used. The relevant PDF can be downloaded at: <https://www.cbos.tas.gov.au/topics/technical-regulation/plumbing-atandards/wastewater/aerated-wastewater-treatment-systems>

SOIL PROFILES – Test Holes 1 and 2

Depth (m) TH1	Depth (m) TH2	Horizon	Description and field texture grade	Soil Cat.
0 – 0.25	0 – 0.2	A1	Dark greyish brown (10YR / 2), Sandy Silty Clay Loam , moist soft consistency, abundant roots, massive breaking to strong fine angular blocky structure	4
0.25 – 0.7	0.2 – 0.7	B2	Light olive brown (2.5Y 5 / 4) with common medium yellowish-brown (10YR 5 / 8) mottles and topsoil down cracks to 0.5 m, Sandy Light Clay , massive, moist stiff consistency	5
0.7 – 0.9	0.7 – 0.85	Cw	Olive yellow (2.5Y 6 / 6) and light yellowish-brown (2.5Y 6/4), Clayey Gravel , dry stiff hard consistency <u>Refusal on weathered dolerite bedrock</u>	2



EMERSON AGGREGATE DISPERSION TEST

Soils with an excess of exchangeable sodium ions on the cation exchange complex (clays), can cause clay dispersion. Under some circumstances the presence of dispersive soils can also lead to significant erosion, and in particular tunnels leading to eventual gully erosion. Dispersive clay subsoil materials can also cause sealing of the soil surface – if left out in wet weather, they then dry and set very hard in dry weather. Based upon field survey of the property and the surrounding area, no erosion was identified at the site.

The subsoil was tested for dispersion using the Emerson Aggregate Test (EAT). Photos of test results are available on request. Testing resulted in Emerson class 2(2), indicating clays with mild dispersion characteristics. Exposure to rainfall/low-electrolyte water may therefore, lead to spontaneous clay dispersion.

To minimise the likelihood of this, we recommend treating the base of the land application area with gypsum at 1.0 - 0.5 Kg/m². During and after construction, cover any exposed subsoil with topsoil and grass seed (or regular treatment gypsum at 1.0 - 0.5 Kg/m²). Minimise subsoil disturbance where possible.

TH #	Depth (m)	Visual sign	Class
1	B2	Some dispersion (obvious milkiness < 50% of aggregate affected)	2(2)

WASTEWATER CLASSIFICATION AND DESIGN

Soil material: **Category 5** (Light Clay), as per criteria set out in AS1547-2012.

Secondary treatment required: **AWTS**

Wastewater loading: 5 persons @ 120 L/day - **600 L/day**.

Design irrigation rate (DIR): **3 mm/day**

Land Application Areas (LAA) required: **200 m² of raised and retained subsurface irrigation (SSI)**

The proposed 3-bedroom dwelling requires a design flow allowance of 600 L/day. Due to the site, soil and planning constraints (previously discussed), secondary treatment via an AWTS with disinfection is required. A rock breaker will be required for in-ground installation of the AWTS.

Using a DIR of 3 mm/day, a **minimum irrigation area of 200 m²** is required. This shall be installed as subsurface irrigation under lawn or landscaped gardens within a raised and retained area of sand/sandy loam fill (**see Spec Sheet**).

Construct the retaining walls for the raised irrigation area with a **1.6 m setback from the cross-slope and downslope boundaries**. This will result in a *parallelogram-shaped* area with side dimensions of 15.75 x 13.10 m – **see Site Plan**. Dripper-line laterals to be installed 0.6 m apart and along the contour – see Spec Sheet. The system will have a total **22 runs of dripper line (laterals), each 13 m long**.

Use Lilac Netafim Unibioline CNL (ID: 16 mm, dripper flow rate: 2.3 L/hr, dripper spacing: 0.3 m, pressure compensating, anti-siphon, non-leakage).

A **disk filter (130 micron / 120 mesh)** is required on the distribution main of the AWTS. All filter valves to be housed in lilac-coloured boxes, installed flush with the ground.

The minimum irrigation pump capacity for the proposed design is **37.0 L/min @ 13.2 m head**. If the minimum pump capacity is not achievable with the standard pump of the AWTS unit (check pump curve data), the **Reefe RHV180** or **Zenox ZHS-040** are suitable units. See Appendix 2 for hydraulic design calculations and minimum pump capacity requirements.

Per M11.1 (d) of the standard, the distribution pump shall run for approximately 3 minutes per cycle. To achieve this for the proposed irrigation system, **set the pump float (on/off) switches shall be set to deliver approximately 110 L per cycle/dose**. This equates to 5 cycles per day at maximum flows.

Construction / Installation

To prepare the LAA, the natural surface should be shallowly scarified (approx. 50 mm deep), when soil conditions are dry. Construct the retaining structures per the spec sheet (with sleepers, landscaped boulders, etc). Ensure the minimum distance between the base of the retaining wall and the boundaries is 1.6 m. **Back-fill with sand/sandy loam fill and grade so that the surface is approximately 10% (5.7°). This slope angle is required to enable a DIR of 3 L/m²/day**. (The natural (7°) slope would necessitate a lower DIR and, hence, a larger LAA which would not fit on the block).

Install the irrigation pipe at **100 mm depth into the imported sand/sandy loam** and seed with grass (further details below) or plant out and mulch.

Install vacuum release valves at highest point/s of the irrigation area. Locate the flush-return, back to the AWTS discharge chamber, at the corner diagonally opposite the supply manifold.

Subsoils were tested for reactivity. The site is classified as **Class S**. All plumbing fixtures and fittings should be installed as per *Appendix G AS/NZS 3500.2.2021*.

The vegetative cover is vital part of the system. The LAA relies on evapotranspiration for excess water removal and plant growth for nutrient removal. For lawns, grass species which are winter active and tolerant to waterlogging are recommended. For heavier (clay-dominant) soils, a pasture mix which includes Tall Fescue (winter active), Phalaris and Kentucky Blue Grass is recommended.

Successful establishment will ensure best possible long-term performance of the LAA. Depending on the environment, protection from local wildlife (using temporary fencing) and supplementary watering may be necessary to establish full cover of the desired pasture species.

For sloping sites, such as this, where imported topsoil is required, we recommend engaging the service at Hydroseed Tasmania to stabilise the soil materials and promote fast establishment of suitable grass species.

Do not mow until the grass has matured - mowing too early or frequently will delay and/or compromise grass establishment. Control weeds during grass establishment phase to ensure good grass cover for the evapotranspiration/absorption area. Installation of the LAA and grass establishment is ideally completed well in advance of occupancy so that some transpiration capacity exists for water removal, upon first use.

If vegetating with landscaped gardens, refer to *Clarence City Council Fact Sheet: Plants Suitable for Aerobic Wastewater Treatment Systems*, appended to this report.

Additional Details – Long Term

When subjected to the maximum design hydraulic load of 600 L/day, the pump will run for a maximum of 16 minutes per day (Appendix 2).

Control weeds during grass establishment phase to ensure effective grass cover for the evapotranspiration/absorption area (LAA). Healthy plants are required for effective evapotranspiration. If the system is consistently underloaded (i.e., by low occupation), supplementary watering may be required – maintain green grass cover. The area should be mowed to encourage growth and nutrient removal. Clippings to be removed – see Loading Certificate.

Compliance with E23.0 of Kingborough IPS

Compliance with E23.10.1 of the *Interim Planning Scheme 2015* is shown in the below table of acceptable and performance criteria.

A1 *Horizontal separation distance from a building to a land application area must comply with one of the following:*

(a) be no less than 6m;	
(b) be no less than; (i) 2m from an upslope or level building; (ii) if primary treated effluent be no less than 4m plus 1m for every degree of average gradient from a downslope building; (iii) if secondary treated effluent and subsurface application, no less than 2m plus 0.25m for every degree of average gradient from a down slope building.	Complies - min. 2.0 m to upslope building

A2 *Horizontal separation distance from downslope surface water to a land application area must comply with any of the following:*

(a) be no less than 100m;	Non-compliance
(b) if the site is within a high rainfall area or the site soil category is 4, 5 or 6, be no less than the following; (i) if primary treated effluent standard or surface application, 50m plus 7m for every degree of average gradient from downslope surface water; (ii) if secondary treated effluent standard and subsurface application, 50m plus 2m for every degree of average gradient from down slope surface water.	Non-compliance therefore P2 must be addressed
(c) if the site is not within a high rainfall area or the site soil category is not 4, 5 or 6, be no less than the following; (i) if primary treated effluent 15m plus 7m for every degree of average gradient from downslope surface water; (ii) if secondary treated effluent and subsurface application, 15m plus 2m for every degree of average gradient from down slope surface water.	N/A

P2 *Horizontal separation distance from downslope surface water to a land application area must satisfy all of the following:*

(a) effluent must be no less than secondary treated effluent standard and applied through a subsurface land application system;	Complies
(b) be no less than 15m;	Complies
(c) the surface water is not of high resource or environmental value;	Complies
(d) the average gradient is no more than 16 degrees;	Complies
(e) the site is not in a flood prone area with an ARI of no less than 20 years;	Complies
(f) either of the following applies: (i) the site soil category is 1, 2 or 3; (ii) a raised bed is used.	Complies – LAA to be raised.

A3 *Horizontal separation distance from a property boundary to a land application area must comply with either of the following:*

(a) be no less than 40m from a property boundary;	Non-compliance
(b) be no less than: (i) 1.5m from an upslope or level property boundary; and (ii) if primary treated effluent 2m for every degree of average gradient from a downslope property boundary; or (iii) if secondary treated effluent and subsurface application, 1.5m plus 1 m for every degree of average gradient from a downslope property boundary.	Complies N/A Non-compliance therefore P3 must be addressed

P3 *Horizontal separation distance from a property boundary to a land application area must satisfy all of the following:*

(a) effluent must be no less than secondary treated effluent standard and applied through a subsurface land application system;	Complies AWTS and SSI
(b) be no less than 1.5m	Complies – 1.6 m adopted
(c) the average gradient is no more than 16 degrees;	Complies – 7 degrees on site
(d) either of the following applies: (i) the vertical separation between the land application area and groundwater or any limiting layer is no less than 1.5m; (ii) a raised bed is used to achieve a minimum vertical separation of 1.5m between the land application area and groundwater or any limiting layer.	Complies SSI to be raised and retained.

A4

Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must be no less than 50m.	N/A
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A5

Vertical separation distance between groundwater and a land application area must be no less than 1.5m.	No ground water encountered
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A6

Vertical separation distance between a limiting layer and a land application area must be no less than 1.5m.	Non-compliance therefore P6 must be addressed
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P6 *Vertical separation distance between a limiting layer and a land application area must satisfy all of the following:*

(a) effluent must be no less than secondary treated effluent standard and applied through a subsurface land application system;	Complies
(b) vertical separation distance must be no less than 0.5m, (whether 'in ground' or by use of a raised bed).	Complies (min vertical separation from bedrock: 0.7 m

A7 The arrangement of a land application area must comply with both of the following:

(a) not include areas beneath buildings, driveways or other hard stand areas;	Complies
(b) have a minimum horizontal dimension of 3m.	Complies

It is a requirement that during construction Doyle Soil Consulting be notified of any major variation to the soil conditions or loading rate as predicted in this report.

It is a requirement of the Directors Determination that the applicant provide a certificate of accreditation for the chosen AWTS. The relevant PDF can be downloaded from: <https://www.cbos.tas.gov.au/topics/technical-regulation/plumbing-standards/wastewater/aerated-wastewater-treatment-systems>

Prior to install, plumber to notify Doyle Soil Consulting of the start-work date for the proposed design. The plumber is to provide photos of the installation, showing all key features including:

- Irrigation system laid out, with pressure testing prior to covering with topsoil
- All specified filters and valves
- Pump unit itself or information on the make and model installed.

A Form 71b and as-installed plan should accompany these photos.

Doyle Soil will not be providing a certificate of compliance until all have been sited.



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APPENDIX 1 – TRENCH™

Doyle Soil Consulting

Land suitability and system sizing for on-site wastewater management
Trench 3.0 (Australian Institute of Environmental Health)

Assessment Report OWMS design for new 3-bedroom dwelling

Assessment for Robert and Maree Jones	Assess. Date	13-Nov-25
	Ref. No.	
Assessed site(s) (Lot 2) 3575 Channel Hwy, Woodbridge	Site(s) inspected	24-Sep-25
Local authority Kingborough Council	Assessed by	R Doyle

This report summarises wastewater volumes, climatic inputs for the site, soil characteristics and system sizing and design issues. Site Capability and Environmental sensitivity issues are reported separately, where 'Alert' columns flag factors with high (A) or very high (AA) limitations which probably require special consideration for system design(s). Blank spaces on this page indicate data have not been entered into TRENCH.

Wastewater Characteristics

Wastewater volume (L/day) used for this assessment = 600 (using the 'No. of bedrooms in a dwelling' method)
 Septic tank wastewater volume (L/day) = 200
 Sullage volume (L/day) = 400
 Total nitrogen (kg/year) generated by wastewater = 4.4
 Total phosphorus (kg/year) generated by wastewater = 1.1

Climatic assumptions for site

(Evapotranspiration calculated using the crop factor method)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean rainfall (mm)	54	56	63	76	72	81	82	95	87	85	75	73
Adopted rainfall (R, mm)	54	56	63	76	72	81	82	95	87	85	75	73
Retained rain (Rr, mm)	46	47	53	65	61	69	70	81	74	73	64	62
Max. daily temp. (deg. C)	22	21	20	18	15	13	13	13	15	17	18	20
Evapotrans (ET, mm)	122	99	74	46	30	19	22	32	50	74	91	112
Evapotr. less rain (mm)	76	51	21	-19	-32	-50	-47	-49	-23	2	27	50

Annual evapotranspiration less retained rain (mm) = 8

Soil characteristics

Texture = Light Clay Category = 5 Thick. (m) = 1.5
 Adopted permeability (m/day) = 0.09 Adopted LTAR (L/sq m/day) = 3 Min depth (m) to water = 3

Proposed disposal and treatment methods

Proportion of wastewater to be retained on site: All wastewater will be disposed of on the site
 The preferred method of on-site primary treatment: In a package treatment plant
 The preferred method of on-site secondary treatment: Above-ground
 The preferred type of in-ground secondary treatment: Trench(es)
 The preferred type of above-ground secondary treatment: Trickle irrigation
 Site modifications or specific designs: Are needed

Suggested dimensions for on-site secondary treatment system

Total length (m) = 11
 Width (m) = 16
 Depth (m) = 1.5
 Total disposal area (sq m) required = 200
 comprising a Primary Area (sq m) of: 200
 and a Secondary (backup) Area (sq m) of:

Sufficient area is available on site

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

The adopted DIR for the category 5 (light clay) soil with 5.7-degree slope is 3 mm/day. Landscaping required to reduce local slope angle at the LAA from 7 degrees. An irrigation area of 200 sq m is required. The system should, therefore, have the capacity to cope with predicted climatic and loading events.

Doyle Soil Consulting
 Land suitability and system sizing for on-site wastewater management
 Trench 3.0 (Australian Institute of Environmental Health)

Site Capability Report
OWMS design for new 3-bedroom dwelling

Assessment for Robert and Maree Jones	Assess. Date	13-Nov-25
	Ref. No.	
Assessed site(s) (Lot 2) 3575 Channel Hwy, Woodbridge	Site(s) inspected	24-Sep-25
Local authority Kingborough Council	Assessed by	R Doyle

This report summarises data relating to the physical capability of the assessed site(s) to accept wastewater. Environmental sensitivity and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) site limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation		Remarks
					Trench	Amended	
A	Expected design area	sq m	250		High		
	Density of disposal systems	/sq km	10		Very low		
	Slope angle	degrees	7		Low		
	Slope form	Straight simple			Low		
	Surface drainage	Imperfect			Moderate		
	Flood potential	Site floods <1:100 yrs			Very low		
	Heavy rain events	Rare			Low		
A	Aspect (Southern hemi.)	Faces SE or SW			High		
	Frequency of strong winds	Common			Low		
	Wastewater volume	L/day	600		Moderate		
	SAR of septic tank effluent		1.0		Low		
	SAR of sullage		2.5		Moderate		
	Soil thickness	m	1.5		Very low		
	Depth to bedrock	m	1.5		Moderate		
	Surface rock outcrop	%	0		Very low		
	Cobbles in soil	%	0		Very low		
	Soil pH		6.0		Low		
Soil bulk density	gm/cub. cm	1.4		Very low			
AA	Soil dispersion	Emerson No.	2		Very high		
	Adopted permeability	m/day	0.09		Low		
A	Long Term Accept. Rate	L/day/sq m	3		High		

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

The site is marginally suitable for onsite wastewater disposal with a small area available and shallow clay soil profiles.

With the prescribed landscaping works, there is sufficient area available for a land application are which complies with AS1547 and code E23 of the Kingborough IPS (2015) so long as an AWTS with disinfection is used.

Doyle Soil Consulting
 Land suitability and system sizing for on-site wastewater management
 Trench 3.0 (Australian Institute of Environmental Health)

Environmental Sensitivity Report
OWMS design for new 3-bedroom dwelling

Assessment for Robert and Maree Jones	Assess. Date	13-Nov-25
	Ref. No.	
Assessed site(s) (Lot 2) 3575 Channel Hwy, Woodbridge	Site(s) inspected	24-Sep-25
Local authority Kingborough Council	Assessed by	R Doyle

This report summarises data relating to the environmental sensitivity of the assessed site(s) in relation to applied wastewater. Physical capability and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation		Remarks
					Trench	Amended	
	Cation exchange capacity	mmol/100g	70			Moderate	Factor not assessed
	Phos. adsorp. capacity	kg/cub m	0.7			Moderate	
	Annual rainfall excess	mm	-8			Very low	
	Min. depth to water table	m	3			Very low	
	Annual nutrient load	kg	5.5			Low	
	G'water environ. value	Agric non-sensit				Low	
	Min. separation dist. required	m	2			Very low	
	Risk to adjacent bores						
	Surf. water env. value	Agric non-sensit				Low	
AA	Dist. to nearest surface water	m	35			Very high	
AA	Dist. to nearest other feature	m	1.6			Very high	
	Risk of slope instability		Very low			Very low	
	Distance to landslip	m	1000			Very low	

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comments

A conservative DIR has been adopted to address the site and soil constraints. Specific site landscaping measures stipulated in the design report

APPENDIX 2 – Design Hydraulics, System Componentry & Pumping Capacity

System Sizing and Componentry - Subsurface Irrigation System - Lot 2 3575 Channel Hwy, Woodbridge		
Design Hydraulic Load (L / day)	Max. DIR (L / m ² / day)	Min. LAA (m ²)
600	3.0	200
System width (m)	Lateral spacing (m)	Number of laterals
NA	0.60	22
Dripper Line material		
Lilac Netafim Unibioline CNL (ID: 14.2 mm, dripper flow rate: 2.3 L/hr, dripper spacing: 0.3 m, pressure compensating, anti-siphon, non-leakage)		
Dripper spacing (m)	Total length irrigation pipe (m)	Number of drippers
0.30	288	960
Dripper flow rate (L / hr)	System flow rate (L/hr)	System flow rate (L/min)
2.3	2208	37
Supply line material	Supply line internal dia. (mm)	Supply line length (m)
Lilac LDPE	25.4	3
Filter Type	Make/Model (or equivalent)	Filter grade
Disk	1 inch AZUD modular 100	120 mesh/130 micron (RED)

Dynamic Head Calculation	
Component	Approx. Head loss (m)
Supply line (friction @ flow rate)	0.2
Filter (friction @ flow rate)	0.7
Other Fittings (friction)	0.2
Elevation differential (from bottom of AWTS to highest point of LAA)	2.0
Dripper Operating head	10.0
Total	13.2 m

Pump Requirements	
Min. pump capacity	Max. Pump time @ Design Hydraulic Load
37 L / min @ 13.2 m head	16 mins / day

Dose volume per pump cycle	Recommended Pump
111 L	Xenox ZHS-040-1A

Demonstration of wastewater system compliance to 2016 Directors Guidelines for On-site Wastewater Disposal

Acceptable Solutions	Performance Criteria	Compliance
<p>A1 Horizontal separation distance from a building to a land application area must comply with one of the following:</p> <ul style="list-style-type: none"> a) be no less than 6m; or b) be no less than: <ul style="list-style-type: none"> i) 3m from an upslope building or level building; ii) If primary treated effluent to be no less than 4m plus 1m for every degree of average gradient from a downslope building; iii) If secondary treated effluent and subsurface application, no less than 2m plus 0.25m for every degree of average gradient from a downslope building 	<p>P1 The land application area is located so that</p> <ul style="list-style-type: none"> a) the risk of wastewater reducing the bearing capacity of a building’s foundations is acceptably low.; and b) is setback a sufficient distance from a downslope excavation around or under a building to prevent inadequately treated wastewater seeping out of that excavation 	<p>Complies with A1 (b) (iii) Land application area will be located with a minimum separation distance of 2.0 m of an UPSLOPE building (2.0 m required)</p>
<p>A2 Horizontal separation distance from downslope surface water to a land application area must comply with (a) or (b)</p> <ul style="list-style-type: none"> a) be no less than 100m; or b) be no less than the following: <ul style="list-style-type: none"> i) if primary treated effluent 15m plus 7m for every degree of average gradient to downslope surface water; or ii) if secondary treated effluent and subsurface application, 15m plus 2m for 	<p>P2 Horizontal separation distance from downslope surface water to a land application area must comply with all of the following:</p> <ul style="list-style-type: none"> a) Setback must be consistent with AS/NZS 1547 Appendix R; b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable. 	<p>Adopted minimum setback distance of 24.5 m to downslope surface water (top of cliff) <u>does not comply with A2</u> - must address P2.</p> <p>P2 (a) adopted min. setback of 24.5 m is consistent with AS/NZS 1547 Appendix R (see below - Selection of Appropriate Setback Distances)</p> <p>P3 (b) risk assessment completed – risk level considered LOW</p>

<p>every degree of average gradient to down slope surface water.</p>		
<p>A3 Horizontal separation distance from a property boundary to a land application area must comply with either of the following:</p> <p>a) be no less than 40m from a property boundary; or</p> <p>b) be no less than:</p> <p>i) 1.5m from an upslope or level property boundary; and</p> <p>ii) If primary treated effluent 2m for every degree of average gradient from a downslope property boundary; or</p> <p>iii) If secondary treated effluent and subsurface application, 1.5m plus 1m for every degree of average gradient from a downslope property boundary.</p>	<p>P3 Horizontal separation distance from a property boundary to a land application area must comply with all of the following:</p> <p>a) Setback must be consistent with AS/NZS 1547 Appendix R; and</p> <p>b) A risk assessment in accordance with Appendix A of AS/NZS 1547 has been completed that demonstrates that the risk is acceptable.</p>	<p>Complies with A3 (b)(i)</p> <p>Minimum Adopted setback distance to downslope boundary (1.6 m) does not comply with A3(b)(iii) - must address P3.</p> <p>P3 (a) adopted min. setback of 1.6 m is consistent with AS/NZS 1547 Appendix R (see below - Selection of Appropriate Setback Distances)</p> <p>P3 (b) risk assessment completed – risk level considered LOW (see below)</p>
<p>A4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must be no less than 50m and not be within the zone of influence of the bore whether up or down gradient.</p>	<p>P4 Horizontal separation distance from a downslope bore, well or similar water supply to a land application area must comply with all of the following:</p> <p>a) Setback must be consistent with AS/NZS 1547 Appendix R; and</p> <p>b) A risk assessment completed in accordance with Appendix A of AS/NZS 1547 demonstrates that the risk is acceptable</p>	<p>No bore or well identified within 50m</p>

<p>A5</p> <p>Vertical separation distance between groundwater and a land application area must be no less than:</p> <p>a) 1.5m if primary treated effluent; or b) 0.6m if secondary treated effluent</p>	<p>P5</p> <p>Vertical separation distance between groundwater and a land application area must comply with the following:</p> <p>a) Setback must be consistent with AS/NZS 1547 Appendix R; and b) A risk assessment completed in accordance with appendix A of AS/NZS 1547 that demonstrates that the risk is acceptable</p>	<p>No groundwater encountered</p>
<p>A6</p> <p>Vertical separation distance between a limiting layer and a land application area must be no less than:</p> <p>a) 1.5m if primary treated effluent; or b) 0.5m if secondary treated effluent</p>	<p>P6</p> <p>Vertical setback must be consistent with AS/NZS1547 Appendix R.</p>	<p>Complies with A6 (b) min. vertical separation is approx. 0.7 m</p>
<p>A7</p> <p>nil</p>	<p>P7</p> <p>A wastewater treatment unit must be located a sufficient distance from buildings or neighbouring properties so that emissions (odour, noise or aerosols) from the unit do not create an environmental nuisance to the residents of those properties</p>	<p>Complies</p>

Selection of Appropriate Setback Distances

Appendix R (AS/NZS1547:2012) “provides a guide on the setback distances that may be applied to land application areas, based on the site constraints identified during the site and soil evaluation”.

Table 1: adapted from Table R1 (AS/NZS1547:2012) - Guidelines for horizontal and vertical setback distances. The specific site features with setback distances (from the proposed LAA) which do not comply with the Acceptable Solutions in Section 3 of the Director’s Guidelines are highlighted in yellow. Use in conjunction with Table 2.

Site feature	Setback distance range (m)	Site constraint items of specific concern (from Table 2)	Min setback distance to satisfy relevant Acceptable Solutions (TAS guidelines)	Adopted setback distance (m)
	Horizontal setback distance (m)			
Property boundary	1.5 – 50	A, D, J	40 m (any direction)	1.6 m from downslope-slope boundary
Buildings/houses	2.0 → 6	A, D, J	N/A	N/A
Surface water	15 –100	A, B, D, E, F, G, J	100 m (downslope)	24.5 m from downslope surface water (top of cliff)
Bore, well	15 – 50	A, C, H, J	N/A	N/A
Recreational areas (Children’s play areas, swimming pools and so on)	3 – 15	A, E, J	N/A	N/A
In-ground water tank	4 – 15	A, E, J	N/A	N/A
Retaining wall and Embankments, escarpments, cuttings	3.0 m or 45° angle from toe of wall (whichever is greatest)	D, G, H	N/A	N/A
	Vertical setback distance (m)			
Groundwater	0.6- >1.5	A, C, F, H, I, J	N/A	N/A
Hardpan or bedrock	0.5 → 1.5	A, C, J	N/A	N/A

Table 2: adapted from Table R2 (AS/NZS1547:2012) – Site constraint scale for setback distances. The constraint items of specific concern are highlighted in yellow.

Item	Site/system feature	Constraint scale (see Note 1)		Sensitive features	Comment	Constraint Rating
		LOWER	HIGHER			
		← Examples of constraint factors (see Note 2) →				
A	Microbial quality of effluent	Effluent quality consistently producing ≤ 10 cfu/100 mL E. coli (secondary treated effluent with disinfection)	Effluent quality consistently producing ≥ 10 ⁶ cfu/100 mL E. coli (for example, primary treated effluent)	Groundwater and surface pollution hazard, public health hazard	Accredited AWTS required (i.e. 2° treatment) with disinfection	Low
B	Surface water	Category 1 to 3 soils, no surface water down gradient within > 100 m, low rainfall area	Category 4 to 6 soils, permanent surface water <50 m down gradient, high rainfall area, high resource/environmental value	Surface water pollution hazard for low permeable soils, low lying or poorly draining areas	2° treated effluent, Cat. 5 soil, low rainfall area, surface water 24.5 m down slope, low resource value	High
C	Groundwater	Category 5 and 6 soils, low resource/environmental value	Category 1 and 2 soils, gravel aquifers, high resource/environmental value	Groundwater pollution hazard	N/A	N/A
D	Slope	0 – 6% (surface effluent application) 0 – 10% (subsurface effluent application)	> 10% (surface effluent application), > 30% subsurface effluent application	Off-site export of effluent, erosion	Approx. 10 % slope at LAA, subsurface application	Low
E	Position of land application area in landscape.	Downgradient of surface water, property boundary, recreational area	Upgradient of surface water, property boundary, recreational area	Surface water pollution hazard, off-site export of effluent	Up gradient of boundary and surface water boundary	High
F	Drainage	Category 1 and 2 soils, gently sloping area	Category 6 soils, sites with visible seepage, moisture tolerant vegetation, low lying area	Groundwater pollution hazard	Cat. 5 soil. No visible seepage. Run-on water from upslope eliminated by house drainage (upslope). Not low lying	Low
G	Flood potential	Above 1 in 20 year flood contour	Below 1 in 20 year flood contour	Off-site export of effluent, system failure, mechanical faults	Above 1:20 year flood contour	Low

Item	Site/system feature	Constraint scale (see Note 1)		Sensitive features	Comment	Constraint Rating
		LOWER	HIGHER			
		Examples of constraint factors (see Note 2)				
H	Geology and soils	Category 3 and 4 soils, low porous regolith, deep, uniform soils	Category 1 and 6 soils, fractured rock, gravel aquifers, highly porous regolith	Groundwater pollution hazard for porous regolith and permeable soils	N/A	N/A
I	Landform	Hill crests, convex side slopes, and plains	Drainage plains and incise channels	Groundwater pollution hazard, resurfacing hazard	N/A	N/A
J	Application method	Drip irrigation or subsurface application of effluent	Surface/above ground application of effluent	Off-site export of effluent, surface water pollution	Subsurface application	Low

Conclusion: the sum of “high” constraint ratings does not exceed the sum of “Low” constraint ratings. As such, the adopted setback distances to downslope water and property boundaries are considered acceptable consistent with AS/NZS 1547:2012 Appendix R.

Risk Assessment

This risk assessment is completed to address (only) those clauses under Section 3 of the *Director's Guidelines for Onsite Wastewater Management Systems* requiring performance criteria.

Risks assessed per the qualitative environmental and public health risk assessment criteria detailed in the *Australian Guidelines for Water Recycling - element 2 (non-potable water)*, with the (below) risk assessment matrix (likelihood x consequence) used to assess level of risk for the specific OWMS design factors.

Qualitative measures of likelihood

Level	Descriptor	Likelihood description
A	Rare	May occur only in exceptional circumstances. May occur once in 100 years
B	Unlikely	Could occur within 20 years or in unusual circumstances
C	Possible	Might Occur or should be expected to occur within a 5 – 10 year period
D	Likely	Will probably occur within a 1 – 5 year period
E	Almost Certain	Is expected to occur with a probability of multiple occurrences within a year

Qualitative measures of consequence / impact

Level	Descriptor	Consequence / impact description
1	Insignificant	Insignificant impact or not detectable
2	Minor	Health – Minor impact for small population Environment – Potentially harmful to local ecosystem with local impacts contained to site
3	Moderate	Health – Minor impact for a large population Environment – Potentially harmful to regional ecosystem with local impacts primarily contained to site
4	Major	Health – Major impact for a small population Environment – Potentially lethal to local ecosystems; predominantly local, but potential for off-site impacts
5	Catastrophic	Health – Major impact for large population Environment – Potentially lethal to regional ecosystem or threatened species; widespread on-site and off-site impacts

Qualitative risk Assessment

Likelihood	1 (insignificant)	2 (minor)	3 (moderate)	4 (major)	5 (catastrophic)
A (rare)	Low	Low	Low	High	High
B (unlikely)	Low	Low	Moderate	High	Very high
C (possible)	Low	Moderate	High	Very high	Very high
D (likely)	Low	Moderate	High	Very high	Very high
E (almost certain)	Low	Moderate	High	Very high	Very high

Note: level of health and environmental risk is specific to the definitions of likelihood and consequence defined in the above, and respective Qualitative Measures tables.

Design factor requiring risk assessment	Potential impacts	Likelihood	Consequence	Risk level	Risk reduction measures (RRM)	Risk level after implementing RRM
Setback distance to downslope surface water	Surface water pollution - eutrophication/public health hazard	C	2	Moderate	Conservative DIR, 2° treatment with disinfection, wired-in alarm at visible location in house for any failures with AWTS.	Low
Setback distance to (downslope) property boundary	Egress of wastewater from site	D	2	Moderate	Located a minimum of 1.6 m from boundaries. Downslope neighbouring land is a 30m wide Public Reserve with minimal expected foot traffic (no foot path evident). SSI system installed within a raised and retained bed of imported sand fill.	Low

CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE ITEM

Section 321

To: Owner name
 Address
 Suburb/postcode

Form **55**

Qualified person details:

Qualified person:
Address: Phone No:
 Fax No:
Licence No: Email address:

Qualifications and Insurance details: *(description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)*

Speciality area of expertise: *(description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)*

Details of work:

Address: Lot No:
 Certificate of title No:
The assessable item related to this certificate: *(description of the assessable item being certified)*
Assessable item includes –

- a material;
- a design
- a form of construction
- a document
- testing of a component, building system or plumbing system
- an inspection, or assessment, performed

Certificate details:

Certificate type: *(description from Column 1 of Schedule 1 of the Director's Determination - Certificates by Qualified Persons for Assessable Items n)*

This certificate is in relation to the above assessable item, at any stage, as part of - (tick one)

building work, plumbing work or plumbing installation or demolition work:

or

a building, temporary structure or plumbing installation:

In issuing this certificate the following matters are relevant –

Documents:

AS/NZS 1547-2012 On-Site Domestic Wastewater Management

Relevant calculations:

References:

AS1547-2012 On-Site Domestic Wastewater Management
Directors Guidelines for On-Site wastewater Management Systems -
CBOS -2017

Substance of Certificate: (what it is that is being certified)

Site and soil evaluation

Scope and/or Limitations

The classification applies to the site as inspected and does not account for future alteration to foundation conditions as a result of earthworks, drainage condition changes or variations in site maintenance.

I certify the matters described in this certificate.

Qualified person:

Signed:



Certificate No:

1848

Date:

27/09/2025



CERTIFICATE OF THE RESPONSIBLE DESIGNER

Section 94
Section 106
Section 129
Section 155

To: Owner name
 Address
 Suburb/postcode

Form **35**

Designer details:

Name: Category:
Business name: Phone No:
Business address:
 Fax No:
Licence No: Email address:

Details of the proposed work:

Owner/Applicant Designer's project reference No.
Address: Lot No:

Type of work: Building work Plumbing work (X all applicable)

Description of work:

(new building / alteration /
addition / repair / removal /
re-erection
water / sewerage /
stormwater /
on-site wastewater
management system /
backflow prevention / other)

Description of the Design Work (Scope, limitations or exclusions): (X all applicable certificates)

Certificate Type:	Certificate	Responsible Practitioner
	<input type="checkbox"/> Building design	Architect or Building Services Designer
	<input type="checkbox"/> Structural design	Structural Engineer
	<input type="checkbox"/> Fire Safety design	Fire Engineer
	<input type="checkbox"/> Civil design	Civil Engineer
	<input checked="" type="checkbox"/> Hydraulic design	Building Services Designer
	<input type="checkbox"/> Fire service design	Building Services Designer
	<input type="checkbox"/> Electrical design	Building Services Designer
	<input type="checkbox"/> Mechanical design	Building Service Designer
	<input type="checkbox"/> Plumbing design	Plumber
	<input type="checkbox"/> Other (specify)	

Deemed-to-Satisfy: Performance Solution: (X the appropriate box)

Other details:

Design documents provided:

The following documents are provided with this Certificate –

Document description:

Drawing numbers:	Prepared by: Doyle Soil Consulting	Date: September 2025
Schedules:	Prepared by:	Date:
Specifications:	Prepared by: Doyle Soil Consulting	Date: September 2025
Computations:	Prepared by:	Date: September 2025
Performance solution proposals:	Prepared by:	Date:
Test reports:	Prepared by: Doyle Soil Consulting	Date: September 2025

Standards, codes or guidelines relied on in design process:

AS1547-2012 On site domestic wastewater management.

National Construction Code 2022 Vol 3

Directors Guidelines for On-site Wastewater Management Systems, Director of Building Control (Tasmania) 2017

Any other relevant documentation:

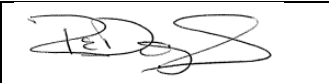
Site and soil evaluation and design report -Proposed onsite wastewater management system by Robyn Doyle

Attribution as designer:

I, Robyn Doyle, am responsible for the design of that part of the work as described in this certificate.

The documentation relating to the design includes sufficient information for the assessment of the work in accordance with the *Building Act 2016* and sufficient detail for the builder or plumber to carry out the work in accordance with the documents and the Act.

This certificate confirms compliance and is evidence of suitability of this design with the requirements of the National Construction Code.

	<i>Name: (print)</i>	<i>Signed</i>	<i>Date</i>
Designer:	R Doyle		27/09/2025
Licence No:	CC7418		

Assessment of Certifiable Works: (TasWater)

Note: single residential dwellings and outbuildings on a lot with an existing sewer connection are not considered to increase demand and are not certifiable.
If you cannot check ALL of these boxes, LEAVE THIS SECTION BLANK.
TasWater must then be contacted to determine if the proposed works are Certifiable Works.

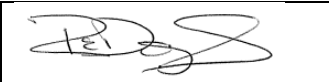
I confirm that the proposed works are not Certifiable Works, in accordance with the Guidelines for TasWater CCW Assessments, by virtue that all of the following are satisfied:

- The works will not increase the demand for water supplied by TasWater
- The works will not increase or decrease the amount of sewage or toxins that is to be removed by, or discharged into, TasWater's sewerage infrastructure
- The works will not require a new connection, or a modification to an existing connection, to be made to TasWater's infrastructure
- The works will not damage or interfere with TasWater's works
- The works will not adversely affect TasWater's operations
- The work are not within 2m of TasWater's infrastructure and are outside any TasWater easement
- I have checked the LISTMap to confirm the location of TasWater infrastructure
- If the property is connected to TasWater's water system, a water meter is in place, or has been applied for to TasWater.

Certification:

I,Robyn Doyle.....being responsible for the proposed work, am satisfied that the works described above are not Certifiable Works, as defined within the *Water and Sewerage Industry Act 2008*, that I have answered the above questions with all due diligence and have read and understood the Guidelines for TasWater CCW Assessments.

Note: the Guidelines for TasWater Certification of Certifiable Works Assessments are available at: www.taswater.com.au

	<i>Name: (print)</i>	<i>Signed</i>	<i>Date</i>
Designer:	Robyn Doyle		27/09/2025



AS1547:2012 – Loading Certificate – AWTS Design

This loading certificate is provided in accordance with Clause 7.4.2(d) of AS/NZS 1547:2012 and sets out the design criteria and the limitations associated with use of the system.

Site Address: 3575, Lot 2, Channel Highway, Woodbridge

System Capacity: 600 L/day (5 persons @ 120 L/person/day)

Summary of Design Criteria

DIR: 3.0 mm/day.

Irrigation area: 200 m²

Reserve area location /use: Assigned – 100 % available

Water saving features fitted: Standard fixtures

Allowable variation from design flows: 1 event @ 200 % daily loading per quarter

Typical loading change consequences: Expected to be minimal due to use of AWTS and large land area

Overloading consequences: Continued overloading may cause hydraulic failure of the irrigation area and require upgrading/extension of the area. Risk considered acceptable due to monitoring through quarterly maintenance reports.

Underloading consequences: Lower than expected flows will have minimal consequences on system operation unless the house has long periods of non-occupation. Under such circumstances, additional maintenance of the system may be required. Long-term underloading of the system may also result in vegetation die-off in the irrigation areas, and additional watering may be required. Risk considered acceptable due to monitoring through quarterly maintenance reports.

Lack of maintenance /monitoring consequences: Issues of underloading/overloading and condition of the irrigation area require monitoring and maintenance, if not completed system failure may result in unacceptable health and environmental risks. Monitoring and regulation by the permit authority are required to ensure compliance.

Livestock are likely to cause soil compaction which may compromise the dripper system and should not be allowed on the LAA

Other considerations: Owners/occupiers must be made aware of the operational requirements and limitations of the system by the installer/maintenance contractor/leasing agent. A copy of the entire design report shall be provided at change of ownership.

IN DRY CONDITIONS, shallowly scarify the natural ground surface and apply gypsum at 0.5 kg/sqm.

Construct a 0.45 m high retaining wall on the downslope side. Ensure a minimum set back distance from all boundaries of 1.6 m.

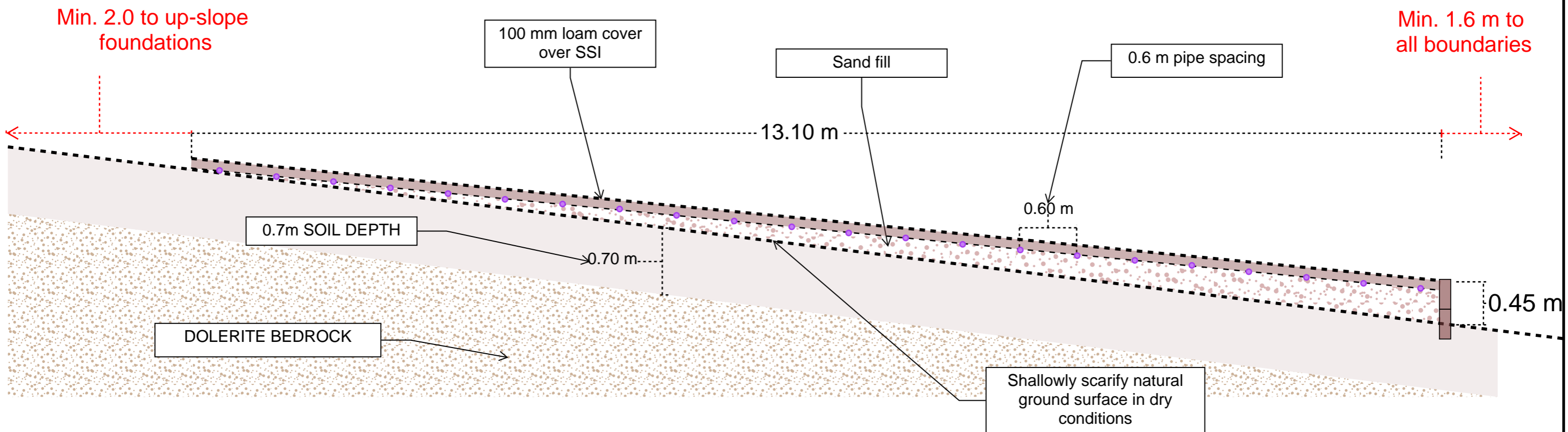
Back fill with sand fill to 0.35 m depth at the down slope end. Grade the sand fill to create a 10% (5.3°) slope. The upper-most SSI line will be on the scarified surface. The lower-most SSI line will rest on 350mm of sand fill. The height of the retaining wall on the northern and southern side will need to taper-off until a gentle (1:3) vegetated soil batter may be utilised

Install the irrigation system onto the graded sand fill. Use Netafim Lilac Unibioline CNL (ID: 16 mm, dripper flow rate: 2.3 L/hr, dripper spacing: 0.3 m, pressure compensating, anti-siphon, non-leakage).

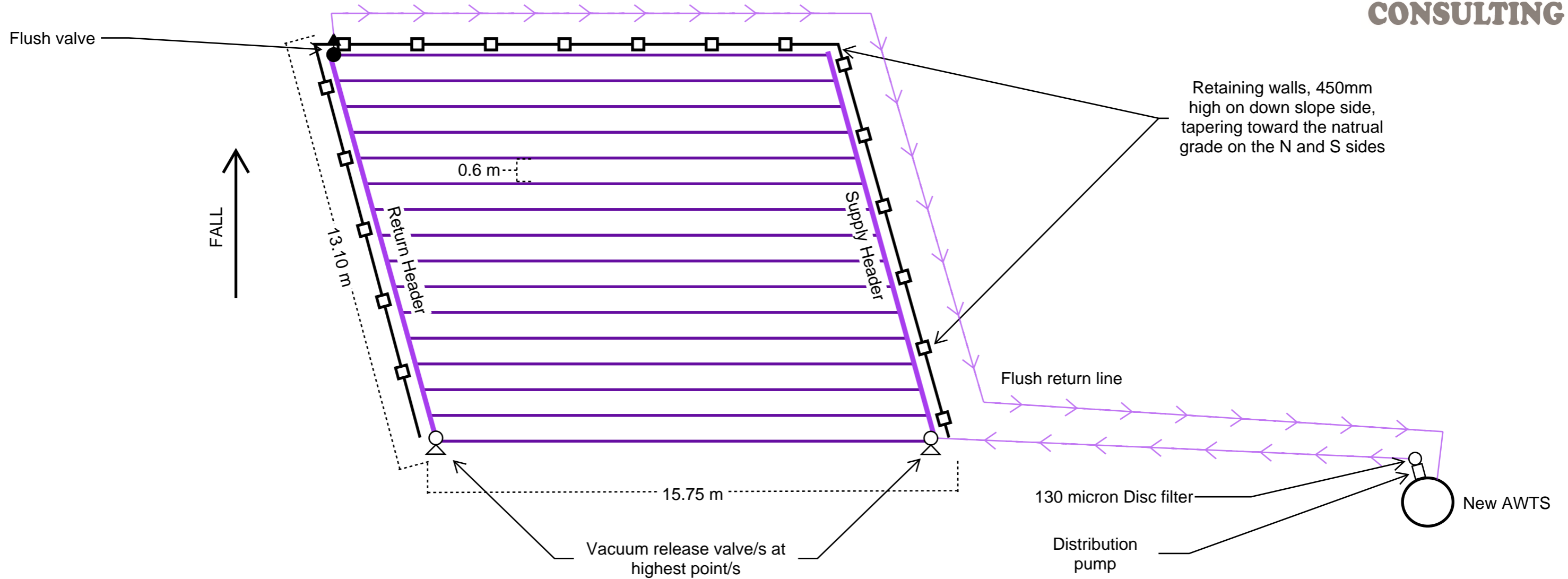
SSI lines to be laid along the contour at 600 mm spacings. Cover irrigation lines with 100 mm loam and vegetate. Recommended that additional (shrub) vegetation be provided in the area between the retaining wall and the downslope boundary.

Include a soil conditioner (e.g. chicken manure, blood and bone, etc.) when seeding the grass to improve establishment. Additional watering will likely be required to establish the grass vegetation. Weed control during grass establishment is recommended.

All onsite wastewater management systems are site-specific. Installer to refer DSC report in full. Please contact the system designer with any questions or proposed changes to the system design prior to proceeding with changes.



Plan View: raised, terraced irrigation area (DRAWING NOT TO SCALE)



Sub-surface irrigation under in raised and retained sand fill. 200 m²

AWTS with 130 micron disc filter.

Ground surface to be prepared per the specifications in the design report. Retaining walls per the Section Plan (previous page) and the design report.

Netafim lilac Netafim Unibioline CNL (ID: 16 mm, dripper flow rate: 2.3 L/hr, dripper spacing: 0.3 m, pressure compensating, anti-siphon, non-leakage). Dripper line to be laid along the contour at 600 mm spacings. Bury at 100 mm depth into imported sandy loam fill.

Supply and Return manifolds, each comprising 25 mm diameter lilac coloured LDPE pipe, to be laid at either end of the dripper lines and buried to a depth of 100 – 200 mm.

Install vacuum breakers at (all) high points. All valves to be placed in valve boxes with screw-down covers that are flush with the finished ground surface.

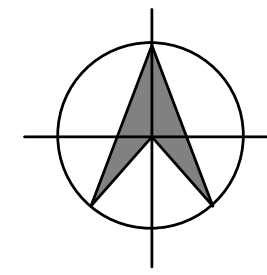
Flush valve to be provided in return line, located diagonally opposite the supply line inlet, and discharging back to the AWTS distribution chamber.

The minimum irrigation pump capacity for the proposed design is 37.0 L/min @ 13.2 m head. If the minimum pump capacity is not achievable with the standard pump of the AWTS unit (check pump curve data), a Reeve RHV180 or Zenox ZHS-040 are suitable alternatives. See Appendix 2 for hydraulic design calculations and minimum pump capacity requirements. Calculation of TDH requirement assuming 25 mm (1") supply main and fittings - see Appendix 2 of design report.

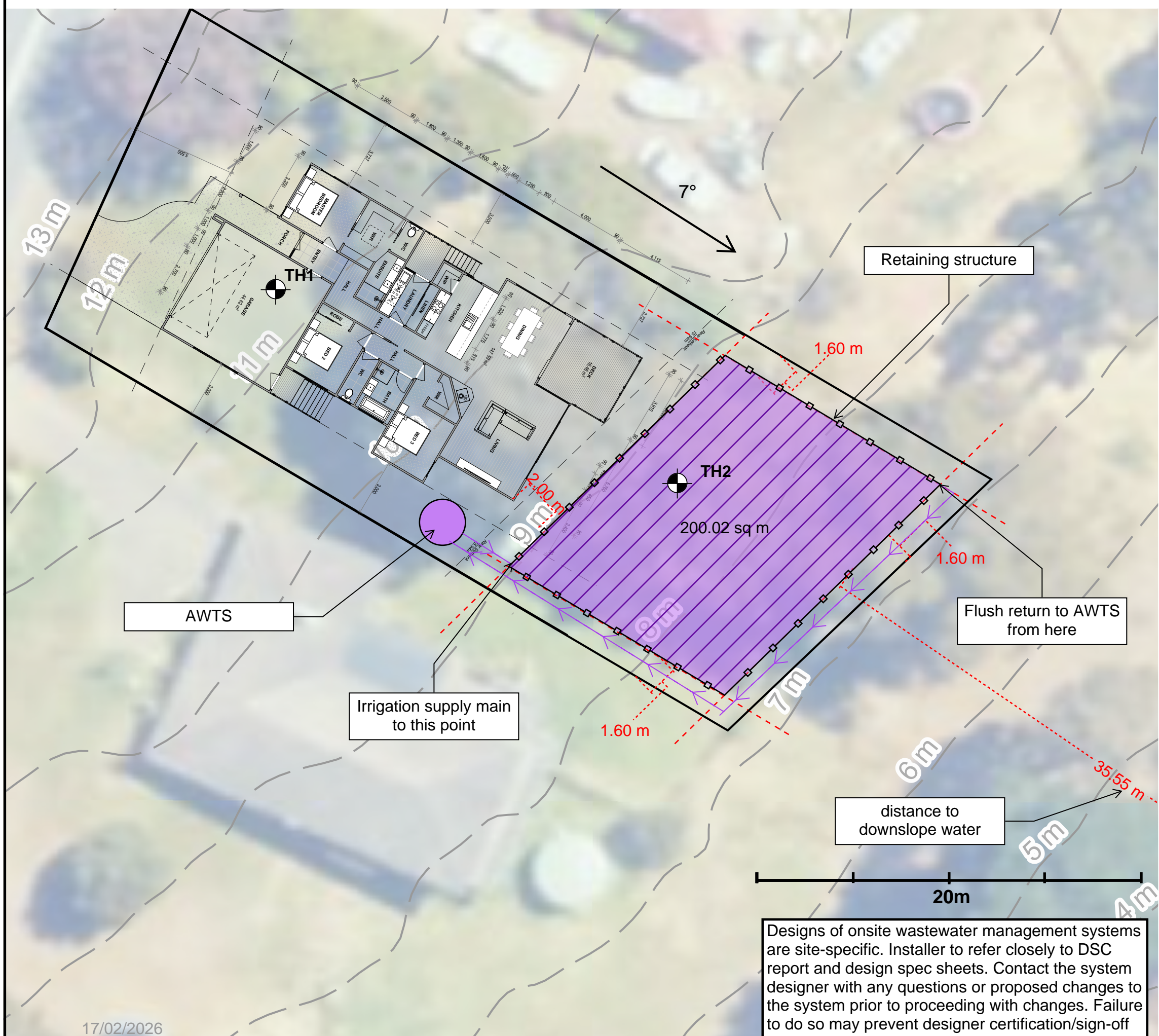
Condition and performance of wastewater land application area to be monitored and reported during routine quarterly maintenance inspections.

All onsite wastewater management systems are site-specific. Installer to refer DSC report in full. Please contact the system designer with any questions or proposed changes to the system design prior to proceeding with changes.

3575 (Lot 2) Channel Highway, Woodbridge



DOYLE SOIL CONSULTING



Treatment system: AWTS with disinfection
 - disk filter (130 micron / 120 mesh) on distribution pump.

Land application area:
 Min. total subsurface irrigation area: 200 m²
 - Installed in the upper 100 mm of raised and retained irrigation bed sand (per the Spec Sheet)
 - laterals installed at 0.6 m spacing
 - feed from the western corner
 - flush return (to AWTS distribution chamber) from eastern corner
 - vacuum release valve/s installed at highest point/s of irrigation area

Shallowly scarify the area at the LAA (approx. 50 mm) and treat with gypsum at 0.5 Kg/m². Construct the retaining structures per the Spec Sheet.

Back fill with sufficient sand fill. Install the irrigation system onto the sand per the Spec Sheet. Cover irrigation lines with 100 mm loam and vegetate. recommended that additional (shrub) vegetation be provided in the area between the retaining walls and the boundaries.

Min up-slope foundations setback: 2.0 m
 Min down-slope foundations setback: 3.75 m
 Min. cross- and down-slope boundary setback: 1.6 m (see risk assessment)
 Min downslope surface water setback: 35.5 m

Approximate test hole locations

Refer to DSC Design Report

Designs of onsite wastewater management systems are site-specific. Installer to refer closely to DSC report and design spec sheets. Contact the system designer with any questions or proposed changes to the system prior to proceeding with changes. Failure to do so may prevent designer certification/sign-off

Prepared by
 Rowan Mason

13/11/25

Robyn Doyle
 Building Services Designer
 Hydraulic
 CC7418

14/11/2025