REF: 6795WW

VERSION [1.0]

MARCH 25, 2024

SOIL & SITE ASSESSMENT FOR ONSITE WASTEWATER DISPOSAL

3 ROSS SMITH PARADE, GREAT MACKEREL BEACH, NSW

LGA: Northern Beaches

Lot 3 & B DP 10000 & 440802

Owners: Victoria and Christopher Logan

Project Manager: Jitka Jankivec

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VERSION CONTROL

Title	Soil & Site Assessment for Onsite Wastewater Disposal			
Site address	3 Ross Smith Parade, Great mackerel Beach, NSW			
Description	Proposed alterations and additions			
Created By	Duncan Meyer B. SocSc. GeogEnvMgmt (Hons) (UKZN)			
Approved by:	Sean Harris Msc Env Science (UOW), Grad dip Nat Res (UNE), BscAppSc, Agriculture (HAC)			
Date Created	Monday, 25 March 2024			
Version Number	**Modified By**	**Modifications Made**	**Date Modified**	**Status**
[1.0]	D.M..	Issue for client review	25/03/2024	Complete

Limitations

The findings and recommendations in this report are based on the objectives and scope of work outlined above. Harris Environmental Consulting performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. The report and conclusions are based on the information obtained at the time of the assessment. Changes to the site conditions may occur subsequent to the investigation described herein, through natural processes or through the intentional or accidental addition of contaminants, and these conditions may change with space and time. The results of this assessment are based upon site assessment conducted by HEC personnel and information provided by the client and site management. All conclusions regarding the property are the professional opinions of the HEC personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, HEC assumes no responsibility or liability for errors in any data obtained from regulatory agencies, information from sources outside of HEC, or developments resulting from situations outside the scope of this project.

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1. INTRODUCTION

This Site and Soil Assessment for On-site Wastewater was prepared by Harris Environmental Consulting (HEC) at the request of Victoria and Christopher Logan. It relates to the proposed alterations and additions that will result in a final 4-bedroom dwelling on Lot 3 & B DP 10000 & 440802 at 3 Ross Smith Parade, Great mackerel Beach, NSW

Fieldwork was undertaken by Harris Environmental Consulting (HEC) on the 18th of March 2024. This plan is based on the primary investigation of the soils, topography, and hydrology of the site observed on the day of inspection. Soil samples and photos of the site were taken for further analysis. This assessment was undertaken for the continued usage of existing Aerated Wastewater Treatment System (AWTS) for wastewater treatment to install a soil absorption bed for treated wastewater disposal.

- Northern Beaches Council's Development Control Plan Local Government Act 1993.
- Australian Standard AS/NZS 3500 Plumbing and Drainage 2018.
- Environment and Health Protection Guidelines (1998) On-site Sewage Management for Single Households (Department of Local Government).
- AS/NZ 1547:2012 On-site wastewater management (Standards Australia, 2012).
- WaterNSW(2019) Designing and Installing Onsite Wastewater Management Systems

The location of the property is shown below in Figure 1

FIGURE 1 LOCATION

Source: SixMaps

2. SITE INFORMATION

Owners:	Victoria and Christopher Logan E: chris@lgiaustralia.com.au	
Project Manager:	Jitka Jankivec *JJ Drafting Australia* E: enquiries@jjdrafting.com.au P: 0414 717 541	
Site address:	3 Ross Smith Parade, Great mackerel Beach, NSW	
Legal title:	Lot 3 & B DP 10000 & 440802	
Local Government:	Northern Beaches Shire Council	
Size of property:	~1136m^2	
Water supply:	Tank	
Wastewater design load: *(As per WaterNSW (2019))*	No. bedrooms in the final dwelling	4
	Total Daily Wastewater Load	**= 800L/day**
Existing wastewater treatment:	AWTS	
Wastewater disposal:	Soil absorption bed	
Date site assessed:	18 March 2024	
Date report prepared:	25 March 2024	
Report prepared by	Duncan Meyer B. SocSc. GeogEnvMgmt (Hons) (UKZN)	
Site assessor:	Sean Harris	Msc Env Science (UOW), Grad dip Nat Res (UNE), BscAppSc, Agriculture (HAC)

3. SITE ASSESSMENT

Climate - rainfall	Mona Vale Golf Club Rainfall Station
Climate - evaporation	Mona Vale Golf Club Evaporation Station
Flood potential	Proposed wastewater treatment system is above 1 in 100-year flood level; minor limitation. Proposed wastewater disposal area above 1 in 20-year flood level; minor limitation.
Frost potential	The site is not known to be subject to severe frosts, minor limitation
Exposure	Eastern aspect; minor limitation
Slope	<5%, moderate limitation
Landform	Flat, minor limitation
Run-on and seepage	Minor upslope stormwater run on; minor limitation
Erosion potential	Minor erosion potential
Site drainage	Well drained, permeable soil profile; saturated soil below 600mm; moderate limitation
Evidence of fill	No evidence of fill; minor limitation
Domestic groundwater use	No groundwater bores within 100m
Surface rock	No surface rock; minor limitation

4. SOIL ASSESSMENT

<table>
<tr><td>Method:</td><td colspan="3">Mechanical auger/crowbar/shovel</td></tr>
<tr><td>Depth to bedrock (m):</td><td colspan="3">1000mm to restrictive layer; minor limitation</td></tr>
<tr><td>Depth to high soil watertable:</td><td colspan="3">No groundwater or subsoil mottling encountered at a depth of 1000mm; minor limitation</td></tr>
<tr><td>Coarse (%):</td><td colspan="3">0-5% coarse fragments in subsoil, minor limitation</td></tr>
<tr><td>pH (soil/water):</td><td colspan="3">pH 5.5-6; minor limitation</td></tr>
<tr><td>Electrical conductivity:</td><td colspan="3"><4dSm, minor limitation</td></tr>
<tr><td>Salinity hazard:</td><td colspan="3">No salinity information available for this area</td></tr>
<tr><td>Domestic groundwater use:</td><td colspan="3">The Department of Primary Industries Office of Water search of groundwater bores found there are no known domestic groundwater bores within 100m of the proposed effluent management area</td></tr>
<tr><td>Geological Unit (From Geoscience Australia Portal)</td><td colspan="3">Coastal deposits – deep Calcareous Sands on beaches, Siliceous Sands and occasional calcareous compressed sands on foredunes</td></tr>
<tr><td>Soil Landscapes (From eSPADE by NSW DPIE):</td><td colspan="3">Narrabeen Soil Landscape – shallow to moderately deep Red Podzolic Soils and Brown Podzolic Soils crests, upper slopes and well-drained areas; deep Yellow Podzolic Soils and Soloths on lower slopes and in drainage depressions</td></tr>
<tr><td>Australian Soil Classification (From Geoscience Australia Portal):</td><td colspan="3">Soils belonging to the Rudosols order - Soils with little pedogenic development, typically loam and clay loam soils and are common on alluvial plains. Low to medium risk provided there is adequate depth to groundwater and not located on a flood plain</td></tr>
<tr><td>Bulk density:</td><td colspan="3">Permeable, well-drained soil profile; minor limitation</td></tr>
<tr><td rowspan="4">Soil Assessment:</td><td colspan="2">Layer 1</td><td>DLR</td></tr>
<tr><td>Texture
Colour
Depth
Structure
Coarse frag.</td><td>Sandy Loam
Brown
0-500mm
Massive
N/A</td><td>N/A</td></tr>
<tr><td colspan="2">Layer 2</td><td>DLR</td></tr>
<tr><td>Texture
Colour
Depth
Structure
Coarse frag.</td><td>Loamy Sand
Brown
500-1000mm
Massive Structured
N/A</td><td>50mm/day</td></tr>
</table>

Photo 1 On-site soil assessment profile

Photo 2 Looking over the proposed soil absorption bed location

5. SUMMARY OF SOIL AND SITE CONSTRAINTS

5.1 PROPOSED BUFFERS

The standard 6m/12m buffers to property boundaries and 40m to surface waters (impounde3d creek) cannot be achieved. In accordance with AS1547(2012), Table R1 *Guidelines for Horizontal and Vertical Setback Distances,* shown in Table 1, reduced buffers are proposed in line with the low risk.

FIGURE 2 EXTRACT FROM TABLE R1 (ASNZ1547,2012)

TABLE R1
GUIDELINES FOR HORIZONTAL AND VERTICAL SETBACK DISTANCES
(to be used in conjunction with Table R2)

Site feature	**Setback distance range** (m) (See Note 1)	**Site constraint items of specific concern** (from Table R2) (see Note 1)
	Horizontal setback distance *(m)*	
Property boundary	1.5 – 50 (see Note 2)	A, D, J
Buildings/houses	2.0 – > 6 (see Note 3)	A, D, J
Surface water (see Note 4)	15 – 100	A, B, D, E, F, G, J

Property boundary

This report recommends a **3m buffer** to the northern, western, and a 9.7m to the southern property boundaries.

All site constraints related to *property boundary* are equivalent to **low risk**.

Surface water

This report recommends a **73.1m buffer from** the blocked creek that is to the west of the proposed soil absorption bed**.** All site constraints related to the surface water are equivalent to low risk as the soil Category 2.

TABLE 1 RISK ASSESSMENT

Property boundary			
Item	Site/system feature	Constraint scale Low Risk	 High Risk
A	Effluent quality	Wastewater treatment to secondary standard	Wastewater treatment to primary standard
D	Slope	Slope 0-10% for subsurface irrigation	>30% slope for subsurface irrigation
J*	Application method	Drip and subsurface irrigation	Surface/above ground application
Surface water			
Item	Site/system feature	Constraint scale Low Risk	 High Risk
A	Effluent quality	Wastewater treatment to secondary standard	Wastewater treatment to primary standard
B	Surface water	Category 1 to 3 soils, no surface water down gradient within >100m, low rainfall area	Category 4 to 6 soils, permanent, <50m down gradient, high rainfall area, high resource/environmental value
D	Slope	Slope 0-10% for subsurface irrigation	>30% slope for subsurface irrigation
E	Position of land application area in landscape	Down gradient of surface water, property boundary, recreational area	Up gradient of surface water, property boundary, recreational area
F	Drainage	Category 1 and 2 soils, gently sloping area	Category 6 soils, sites with visible seepage, moisture tolerant vegetation, low lying area
G	Flood potential	Above 1 in 20 year flood contour	Below 1 in 20 year flood contour
J*	Application method	Drip and subsurface irrigation	Surface/above ground application

*equivalent to soil absorption bed

6. SYSTEM DESIGN

6.1 WASTEWATER TREATMENT SYSTEM

The existing Super Treat AWTS has the capacity to treat 1500L/d and appears to be in good working order. The design flow is 800L/day so the AWTS has sufficient capacity.

6.2 PIPES

The sewer pipes between the AWTS and soil absorption bed must conform with 'AS/NZS 3500(Set):2015 Plumbing and Drainage Set' specifying the nominal pipe sizes and respective minimum grades. Table 2 contains these specifications.

The sewer pipes between the AWTS and soil absorption bed must be buried at a depth that provides protection against mechanical damage or deformation, in accordance with 'AS/NZS 3500(Set):2015 Plumbing and Drainage Set'. Table 3 shows the minimum pipe depth for trafficable areas.

TABLE 2 MINIMUM PIPE DIAMETER AND GRADE CALCULATIONS

Nominal pipe size (DN)	Minimum grade %	Minimum grade ratio
65	2.5	1:40
80	1.65	1:60
100	1.65*	1:60
125	1.25	1:80
150	1.00	1:100
* Except for drains from septic tanks, sewage treatment plants and unvented discharge pipes from tundishes, which may have a minimum grade of 1%, Source: ‘AS/NZS 3500.2:2018 Plumbing and drainage Part 2 Sanitary plumbing and drainage’ Table 3.4.1. NB: pipe grades are expressed as a percentage of vertical to horizontal distances.		

TABLE 3 MINIMUM PIPE DEPTH FOR TRAFFICABLE AREAS

Location	Minimum depth of cover (mm) for all materials other than cast iron
Where subject to vehicular traffic	500
Elsewhere	300
Source: ‘AS/NZS 3500 (Parts 0-4):2018 Plumbing and drainage Set’. Table 3.7.2 Minimum Cover for Buried Pipes’	

7. SIZING OF SOIL ABSORPTION BEDS

The soil absorption bed can be constructed within the range of widths and depths shown in Table 4 (ASNZ1547, 2012)**.** The bed can be no deeper than 600mm and no wider than 4m**.** For this site, the proposed base of the bed is 450mm below the ground surface (300mm aggregate and 150mm topsoil).

TABLE 4 DIMENSIONS FOR CONSTRUCTING SOIL ABSORPTION BED

	Typical dimensions (mm)	Maximum (mm)	Minimum (mm)
Width	1000-4000	4000	1000
Depth of aggregate	300-600	600	300
Depth of topsoil	100-150	150	100
Spacing between adjacent beds	-	NA	1000
Source: 'AS/NZS 1547:2012 *On-site* domestic wastewater management			

The size of the soil absorption bed is calculated using the formulae in AS/NZ 1547(2012). It is based on design flow rate, design width and Design Loading Rate (DLR), which is the amount of effluent that, over the long-term, be applied each day per area of an infiltrative surface without failure of the infiltrative surface. ASNZ1547(2012) recommends a DLR of 50mm/day for loamy sand soils.

The AS/NZ1547(2012) method for calculating bed size is as follows:

$$L = \frac{Q}{DLR \times W}$$

Where

L = Length in m
Q = Design daily flow in L/day **(800L/day)**
W = Width in m
DLR = Design Loading Rate in mm/d **(50mm/day)**

The proposed configuration will include **one (1), 7.7m long x 2.1m wide beds** The configuration may need to be adjusted to suit the alignment along the contour.

8. SUMMARY

The assessment was prepared for the proposed alterations and additions that will result in a final 4-bedroom dwelling and recommends the following:

- Continued use of the existing Aerated Wastewater Treatment Systems;
- Installation of one (1), 7.7m long x 2.1m wide bed, as described in the Appendix and shown on the Site Plan.

9. REFERENCES

Northern Beaches Council's Development Control Plan

Department of Local Government (1998) *On-site Sewage Management for Single Households*. NSW Government.

Standards Australia (2012) Australian/New Zealand Standard 1547:2012 *On-site domestic wastewater management*. Standards Australia.

NSW Health Septic Tank Accreditation Guidelines (2001).

Hazelton, P.A and Murphy, B.W ed. (1992) *What Do All the Numbers Mean? A Guide for the Interpretation of Soil Test Results.* Department of Conservation and Land Management (incorporating the Soil Conservation Service of NSW), Sydney.

WaterNSW (2019), Designing and Installing On-Site Wastewater Systems. A Sydney Catchment Authority Current Recommended Practice.

APPENDIX I CONSTRUCTION OF SOIL ABSORPTION BEDS

read in conjunction with Standard Drawing attached. Refer to these documents if further clarification is required.

Step 1: Site Preparation

Obtain a copy of the council approved plans and conditions of consent. Accurately locate beds as shown on the site plans and according to the specified and approved design and/or any covenant. Check the location of all constructed beds against the approved site plans. If there is any change in their position from the site plans, a Section 96 application (from the *Environmental Planning and Assessment Act 1979)* must be made to the council to alter their position.

Step 2: Positioning

Build the beds along the contours and use laser leveling to ensure that the base is exactly level. If this does not happen, distribution will not be even and one part of the bed will be more heavily loaded. This could cause the most heavily loaded part of the bed to fail prematurely, with further creeping failure as the effluent is forced to more distant parts of the bed.

The basal area of the beds has been determined according to the procedures in AS/NZS 1547(2012) and WaterNSW (2019) . This includes a minimum bed length to width ratio of 3:1, beds must be installed parallel to the site contours and beds must be of the same basal area if they are receiving the same volume of wastewater.

Always avoid cutting bed through existing weakened ground (eg., through the alignments of former underground pipes, cables or conduits) as they may provide preferential pathways for the effluent to escape from the bed. If they cut downslope through the ground occupied by a series of bed, effluent may preferentially flow to the lowest bed causing it to fail or surcharge. Where it is unavoidable to cut into alignment or it happens accidentally, seal the weaknesses in the bed walls with cement or bentonite grout.

Step 3: Timing

Build beds during fine weather. If it rains before beds are completed, they should be covered to protect them from rain damage.

Once dug, complete the beds promptly to avoid foreign material being washed into the open bed. In particular, avoid puddling, where clay settles out at the bottom of a water filled trench exposed to rain, as clay settling on the base of the bed will reduce bed performance.

Step 4: Excavation

- Carefully excavate the base of any bed and level it with a dumpy or laser level. The bed must be level along and across the line of the bed. If there is a slope across the base of the bed, the effluent will drain to and preferentially load the downslope side of the bed, which may then fail or overflow.

- Where beds are dug along the contour on sloping ground by an excavator that does not have a pivoting bucket, the base of the bed will probably be cut parallel to the ground surface. In this case, the base of the bed will have a fall towards the downslope side. The bed should be further hand dug to level the base and stop excessive effluent accumulating against the downslope wall of the bed.

- Where beds are dug by excavator in clayey soils, any smearing of the bed walls and floor must be fixed by scarifying the surface.

Step 5 Construction

- Install arch drain (Reln) that complies with AS/NZS1547:2012.

- Ensure that the sides of beds are not damaged or caused to collapse when the beds are filled with gravel or sand.

- Beds can be filled with gravel (typically 20-40 millimetres).

- Lay geotextile filter cloth over the gravel and under the topsoil to ensure that the topsoil does not penetrate and block the bed.

- Test the beds with clean water before filling with gravel to ensure effective and even distribution of effluent.

- Apply 150 to 200 millimetres of topsoil to the top of the bed and leave it slightly mounded above ground level to allow it to settle and to encourage incident rainfall to be shed away from the top of the bed.

- The top of the absorption bed area should be turfed or grass planted to establish vegetation cover promptly after construction. This ensures the best uptake of effluent by evapotranspiration. Ensure that larger deep-rooting plants are not planted close to bed to reduce the chance of root intrusion and clogging of the beds.

- A stormwater diversion berm/ drain should be built on sloping sites upslope of the absorption beds.

Step 6: Dosing

- Beds may be gravity-fed or pressure-dosed using pumps or dosing siphons. Raised pressure-dosed absorption beds are a possible alternative where there are shallow limiting layers present (eg bedrock, clay or water table) and not enough separation distance from that layer. The linear loading rate must be addressed in these situations.

- Install a hydraulically operated indexing valve that delivers effluent to a different trench / bed or set of laterals at each pump cut-in.

APPENDIX II GENERAL RECOMMENDATIONS TO MANAGE WATER QUALITY AND QUANTITY

Insinkerator style kitchen garbage disposal units should be avoided as they increase water consumption and raise the nutrient and BOD concentrations of household effluent.

Water conservation can reduce the volume of wastewater that needs to be treated and discharged on site. The residence should include appliances that are rated under the Water Efficiency Labelling and Standards (WELS) Scheme that includes:

i. 4-star dual-flush toilets;
ii. 3-star showerheads;
iii. 4-star taps (for all taps other than bath outlets and garden taps);
iv. 3-star urinals; and
v. Water-efficient washing machines and dishwashers are to be specified and used wherever possible.

Chemical cleaning compounds and other chemicals that enter the treatment system should be low in phosphate and salt. Anti-bacterial chemical cleaning compounds and other chemicals that enter the treatment system should be avoided. This includes chlorine, disinfectants, bleaches etc.

APPENDIX III RISK ASSESSMENT FOR SURFACE WATERS (AS/NZ1547,2012)

TABLE R1
GUIDELINES FOR HORIZONTAL AND VERTICAL SETBACK DISTANCES
(to be used in conjunction with Table R2)

Site feature	**Setback distance range** (m) (See Note 1)	**Site constraint items of specific concern** (from Table R2) (see Note 1)
	Horizontal setback distance *(m)*	
Property boundary	1.5 – 50 (see Note 2)	A, D, J
Buildings/houses	2.0 – > 6 (see Note 3)	A, D, J
Surface water (see Note 4)	15 – 100	A, B, D, E, F, G, J
Bore, well (see Notes 5 and 6)	15 – 50	A, C, H, J
Recreational areas (Children's play areas, swimming pools and so on) (see Note 7)	3 – 15 (see Notes 8 and 9)	A, E, J
In-ground water tank	4 – 15 (see Note 10)	A, E, J
Retaining wall and Embankments, escarpments, cuttings (see Note 11)	3.0 m or 45° angle from toe of wall (whichever is greatest)	D, G, H
	Vertical setback distance *(m)*	
Groundwater (see Notes 5, 6, and 12)	0.6 – > 1.5	A, C, F, H, I, J
Hardpan or bedrock	0.5 – ≥ 1.5	A, C, J

NOTES:

1 The overall setback distance should be commensurate with the level of risk to public health and the environment. For example, the maximum setback distance should be adopted where site/system features are on the high end of the constraint scale. The setback distance should be based on an evaluation of the constraint items and corresponding sensitive features in Table R2 and how these interact to provide a pathway or barrier for wastewater movement.

2 Subject to local regulatory rules and design by a suitably qualified and experienced person, the separation of a drip line system from an upslope boundary, for slopes greater than 5%, may be reduced to 0.5 m.

TABLE R2
SITE CONSTRAINT SCALE FOR DEVELOPMENT OF SETBACK DISTANCES
(used as a guide in determining appropriate setback distances from ranges given in Table R1)

Item	Site/system feature	Constraint scale (see Note 1) LOWER ← Examples of constraint factors (see Note 2)	→ HIGHER	Sensitive features
A	Microbial quality of effluent (see Note 3)	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
B	Surface water (see Note 4)	Category 1 to 3 soils (see Note 5) 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 (see Note 6)	Surface water pollution hazard for low permeable soils, low lying or poorly draining areas
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
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
E	Position of land application area in landscape (see Note 6)	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
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
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
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
I	Landform	Hill crests, convex side slopes, and plains	Drainage plains and incise channels	Groundwater pollution hazard, resurfacing hazard
J	Application method	Drip irrigation or subsurface application of effluent	Surface/above ground application of effluent	Off-site export of effluent, surface water pollution

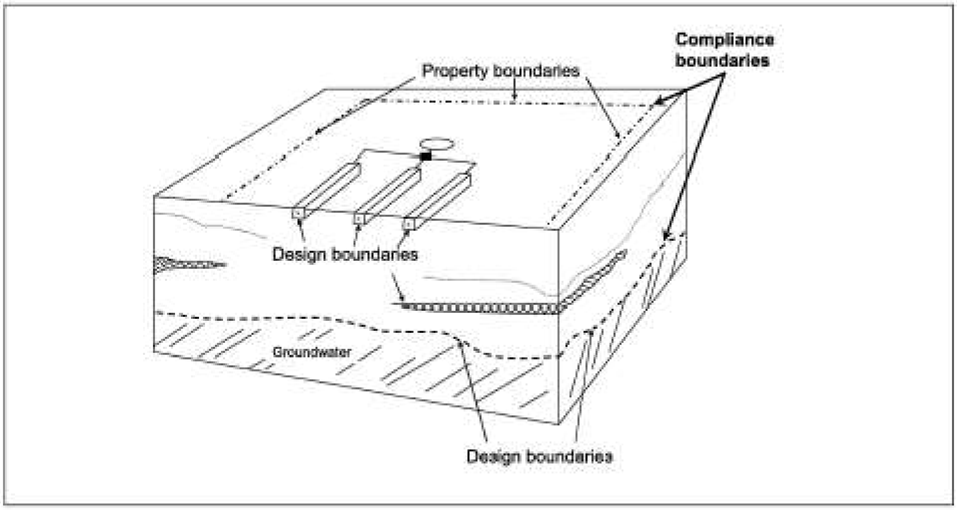
NOTES:

1 Scale shows the level of constraint to siting an on-site system due to the constraints identified by SSE evaluator or regulatory authority. See Figures R1 and R2 for examples of on-site system design boundaries and possible site constraints.

2 Examples of typical siting constraint factors that may be identified either by SSE evaluator or regulatory authority. Site constraints are not limited to this table. Other site constraints may be identified and taken into consideration when determining setback distances.

TABLE R2
SITE CONSTRAINT SCALE FOR DEVELOPMENT OF SETBACK DISTANCES
(used as a guide in determining appropriate setback distances from ranges given in Table R1) (continued)

3	The level of microbial removal for any on-site treatment system needs to be determined and it should be assumed that unless disinfection is reliably used then the microbial concentrations will be similar to primary treatment. Low risk microbial quality value is based on the values given in ARC (2004), ANZECC and ARMCANZ (2000), and EPA Victoria *(Guidelines for environmental management: Use of reclaimed water* 2003).
4	Surface water, in this case, refers to any fresh water or geothermal water in a river, lake, stream, or wetland that may be permanently or intermittently flowing. Surface water also includes water in the coastal marine area and water in man-made drains, channels, and dams unless these are to specifically divert surface water away from the land application area. Surface water excludes any water in a pipe or tank.
5	The soil categories 1 to 6 are described in Table 5.1. Surface water or groundwater that has high resource value may include potable (human or animal) water supplies, bores, wells, and water used for recreational purposes. Surface water or groundwater of high environmental value include undisturbed or slightly disturbed aquatic ecosystems as described in ANZECC and ARMCANZ (2000).
6	The regulatory authority may reduce or increase setback distances at their discretion based on the distances of the land application up or downgradient of sensitive receptors.



(Adapted from USEPA 2002)

FIGURE R1 EXAMPLE OF DESIGN AND COMPLIANCE BOUNDARIES FOR APPLICATION OF SETBACK DISTANCES FOR A SOIL ABSORPTION SYSTEM

Issue:	Description:	Date	Drawn	Approved
v0.1	Issue for client review	19/03/2024	DM	SH

North
N

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Project:
PROPOSED ALTERATIONS AND ADDITIONS
LOT 3 & B DP 10000 & 440802
3 ROSS SMITH PARADE, GREAT MACKERAL BEACH
LGA: NORTHERN BEACHES

Drawing Title:
WASTEWATER MANAGEMENT PLAN DETAILS SHEET No.1

Drawn:	Date:	Paper Size:	Q.A. Check:	Date:
DM	19/09/2024	ISO Expand A3	Complete	19/03/2024
Designed:	Our reference:	Scale:	Issue:	
DM	6735WW	1:600	v0.1	

Issue:	Description:	Date	Drawn	Approved
v0.1	Issue for client review	19/03/2024	DM	SH

North

N

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Wastewater | Bushfire | Stormwater

Project:

PROPOSED ALTERATIONS AND ADDITIONS

LOT 3 & B DP 10000 & 440802

3 ROSS SMITH PARADE, GREAT MACKERAL BEACH

LGA: NORTHERN BEACHES

Drawing Title:

WASTEWATER MANAGEMENT PLAN DETAILS SHEET No.2

Drawn:	Date:	Paper Size:	Q.A. Check:	Date:
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Designed:	Our reference:	Scale:	Issue:	
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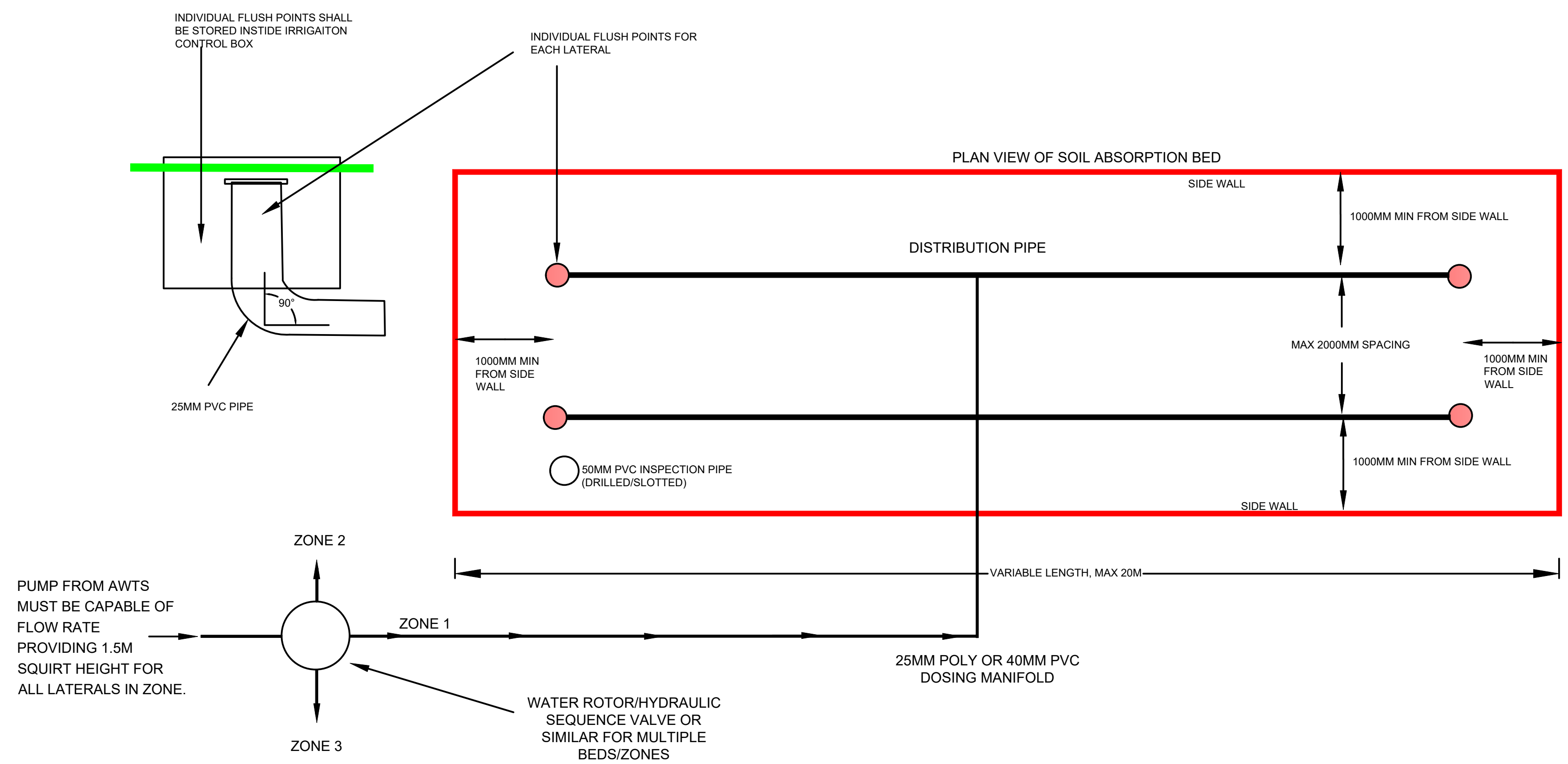

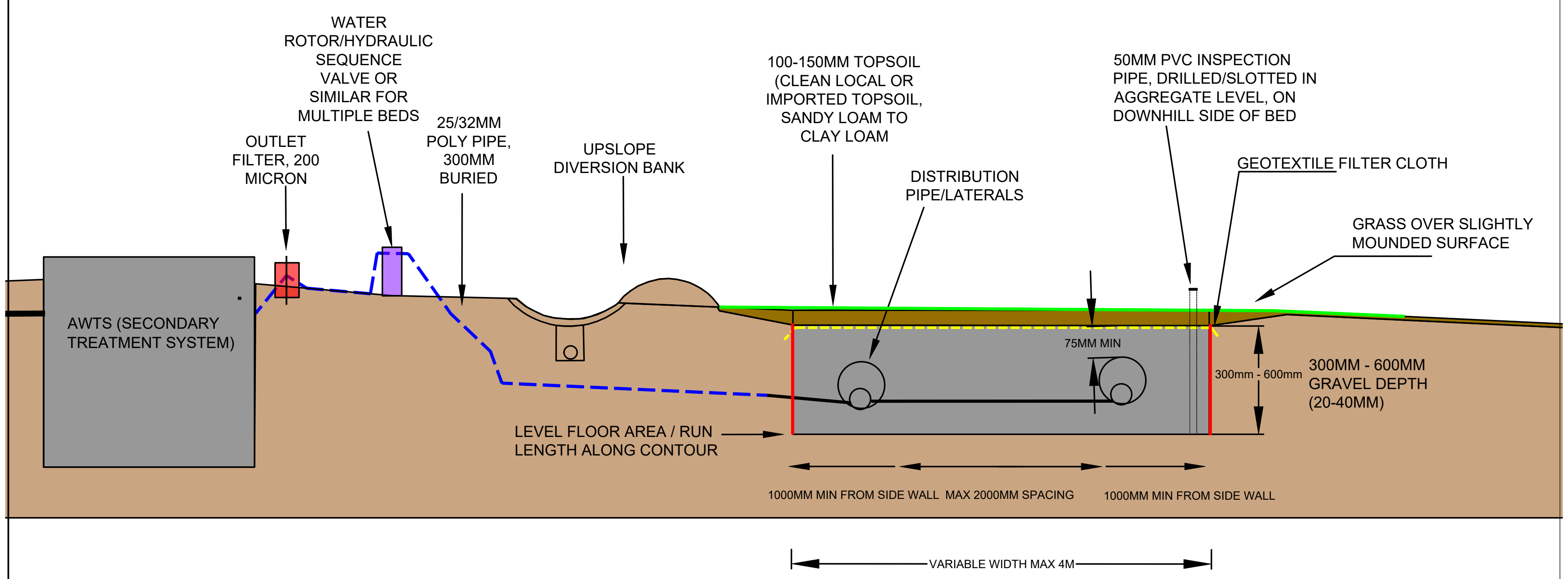

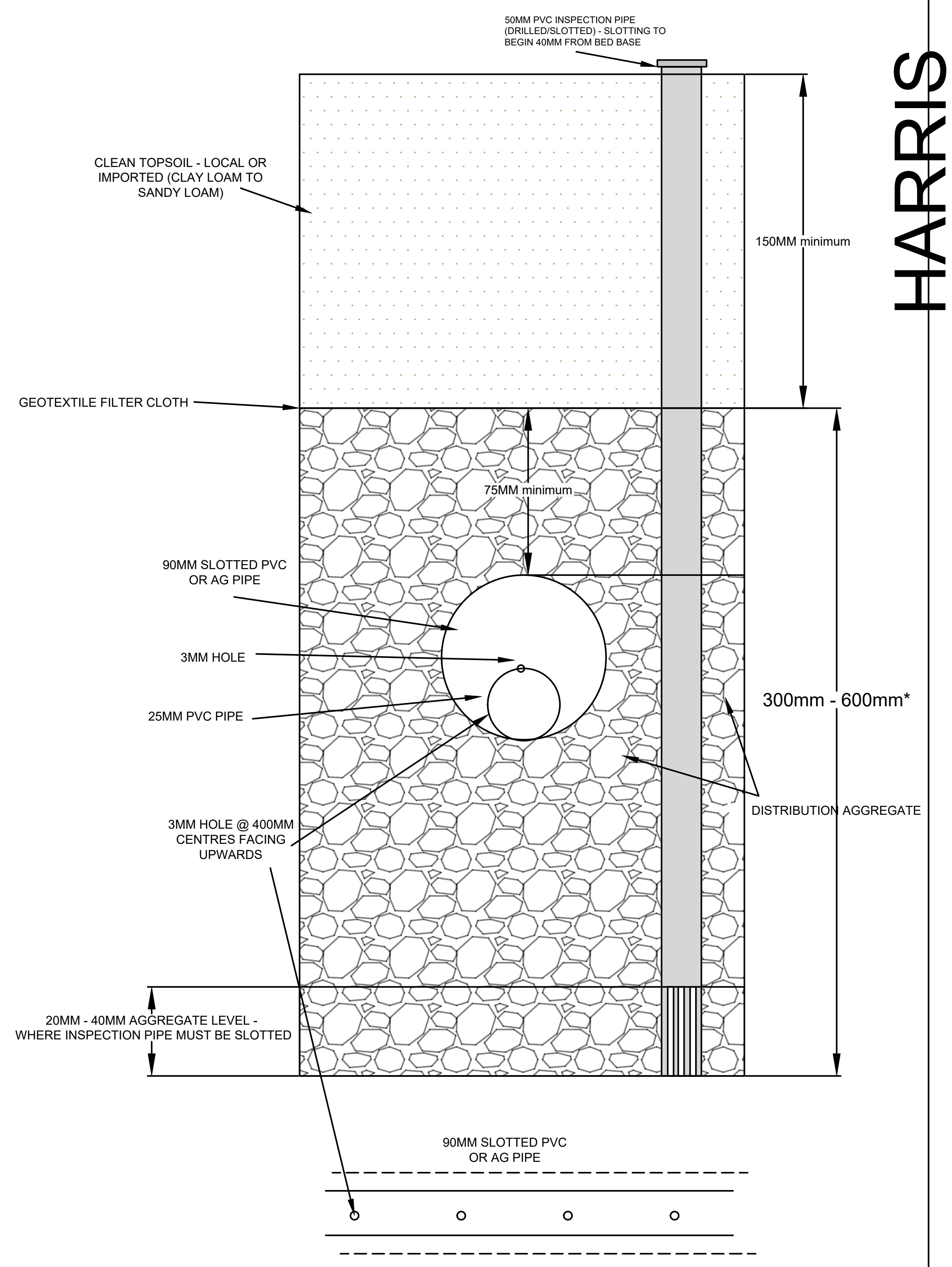

*ASNZ1547 (2012) PROVIDES A RANGE for AGGREGATE OF 300-600MM. THE FINAL DEPTH CAN BE DECIDED BY THE INSTALLER - UNLESS SPECIFIED TO BE DEEPER IN THIS REPORT.

Issue:	Description:	Date	Drawn	Approved
A	HEC Standard Drawing			SH

Harris environmental CONSULTING

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Wastewater | Bushfire | Stormwater

Project
DESIGN IN ACCORDANCE WITH ASNZ1547 (2012) & DESIGN AND INSTALLATION OF ON-SITE WASTEWATER SYSTEMS - WATER NSW (2019)

Drawing Title:
PRESSURE DOSED SOIL ABSORPTION BED STANDARD DRAWING

Drawn:	Date:	Scale: NTS	Q.A. Check:	Date:
Designed:	Our reference:		Dwg. No.	Issue: A