
**ON-SITE WASTEWATER ASSESSMENT FOR 232 -252
LLANDILO ROAD, BERKSHIRE PARK**

FOLIO NO: LOT 4 DP 510842

LGA: PENRITH CITY COUNCIL

OWNER: JASON & MICHELLE ZAMMIT

August 2012

Our ref: 771ww

HARRIS ENVIRONMENTAL CONSULTING

ABN 6156 3609 153

PO BOX 70

JAMBEROO 2533

Ph (02) 42360 954

Fx (02) 42361 410

Mobile 0425 335 245

email: sean@harrisenvironmental.com.au

web: www.harrisenvironmental.com.au



TABLE OF CONTENTS

1.	ASSESSMENT CRITERIA.....	3
2.	SITE INFORMATION.....	4
3.	SITE ASSESSMENT.....	4
4.	SOIL ASSESSMENT.....	5
5.	PROPOSED METHOD OF WASTEWATER TREATMENT.....	9
6.	AREA REQUIRED FOR EFFLUENT DISPOSAL.....	9
7.	EXISTING WASTEWATER TREATMENT SYSTEM.....	9
8.	GENERAL ADVICE FOR IN HOUSE WATER MANAGEMENT.....	9
9.	SUMMARY.....	10
10.	REFERENCES.....	11

FIGURES

Figure 1	Location.....	3
Figure 2	General layout.....	7
Figure 3	Irrigation layout.....	8

1. ASSESSMENT CRITERIA

The owners of 232-252 Llandilo Road, Berkshire Park propose to construct a four bedroom residence on this residential property. An existing fibro residence has a septic tank and trench which will be retained. An AWTs will be installed for proposed residence. Harris Environmental Consulting was commissioned to undertake this Soil and Site Assessment for On Site Wastewater Management in accordance with:


- Penrith City Council's On-site Sewage Management and Greywater Reuse Policy
- Local Government Act 1993
- Australian Standard AS/NZS 3500 Plumbing and Drainage 2003
- 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)

The location of the property is shown on Figure 1.

Figure 1 Location



2. SITE INFORMATION

Our Ref:	771ww	
Owner:	Jason and Michelle Zammit	
Folio:	Lot 4 DP 510842	
Site address:	232-252 Llandilo Road, Berkshire Park	
Size of property:	~2 ha	
Local Government Area:	Penrith	
Water supply and daily use (L/day)	Town 145	
Wastewater design load:	No. bedrooms in proposed residence	4
	Potential bedrooms	2
	Total potential bedrooms	6
	Occupants/bedroom	1.6
	Total no. occupants	9.6
	Wastewater generated number of occupants	x 1392
Existing wastewater treatment for fibro cottage:	Septic tank and trench	
Proposed wastewater treatment for new residence:	AWTS	
Proposed wastewater disposal for new residence:	Spray irrigation	
Date site assessed:	16/08/2012	
Date report prepared:	17/08/2012	
Site assessor:	 Msc Env Science (UOW), Grad dip Nat Res (UNE), BscAppSc, Agriculture (HAC) Sean Harris	

3. SITE ASSESSMENT

Climate - rainfall	Penrith Rainfall Station (median annual 779mm)
Climate - evaporation	Badgerys Creek (median 1557mm)
Flood potential	Proposed wastewater treatment system to be located at the same elevation as existing septic tank and residence. Flood potential of existing septic tank and residence is not known, but unlikely to be a constraint as the house is located at the same level.
Exposure	Northern aspect; minor limitation
Slope	0-1% slope; minor limitation for spray irrigation
Landform	Flat, minor limitation
Run-on	Minor potential for stormwater run-on
Erosion potential	Minor erosion potential
Site drainage	Moderate to well drained soil profile; minor limitation
Evidence of fill	No evidence of fill; minor limitation

Domestic groundwater use	No known groundwater bores are within 200m, minor limitation	
Buffers from:	Required distance to EMA	Distance available
Permanent waters:	100m	100m+
Named river/reservoir:	150m	150m+
Intermittent drainage line :	40m	40m+
Broad drainage depression	40m	40m+
Boundary (upslope/downslope):	3-6m	3m
Buildings (upslope/downslope):	3-6m	6m+
Buildings:	15m	15m
Surface rock	No surface rock; minor limitation	
Area available for effluent disposal	Area available for effluent disposal within designated Effluent Management (EM) area, minor limitation	

4. SOIL ASSESSMENT

Method	Crowbar and shovel			
Saturation depth to impermeable layer	1000mm+ to restrictive layer; minor limitation			
Depth to high soil watertable (m)	Groundwater not encountered at 1000mm but mottling of subsoils below 500mm indicates restricted drainage; moderate limitation			
Surface rock	No surface rock; minor limitation			
Bulk density	No evidence of soil compaction, minor limitation.			
Design Irrigation Rate (mm/day) in accordance with AS/NZ1547(2000)	Design Irrigation Rate: adopted DIR for clay loam subsoil receiving secondary treated effluent is 20mm/d.			
pH (soil/water)	pH 5-6.5; minor limitation.			
Electrical conductivity (1:5) (dS/m)	<4, indicating salinity is not a constraint; minor limitation			
Emerson Aggregate Test (EAT)	3(1) minor limitation			
Soil profile:	Layer 1		DLR	DIR
	Texture	Clay loam	NA	20mm
	Colour	grey		
	Depth	0-400mm		
	Mottling	NA		
	Coarse fragments	NA		
	Soil structure	Weakly structured		
	Layer 2		DLR	DIR
	Texture	Medium clay	NA	NA
	Colour	Orange		
Depth	400-1000mm			
Mottling	5%			
Coarse fragments	5%			

Photo 1 Proposed irrigation area (looking downslope towards road)



Photo 2 Proposed irrigation area (looking back to road)



Figure 2 General layout

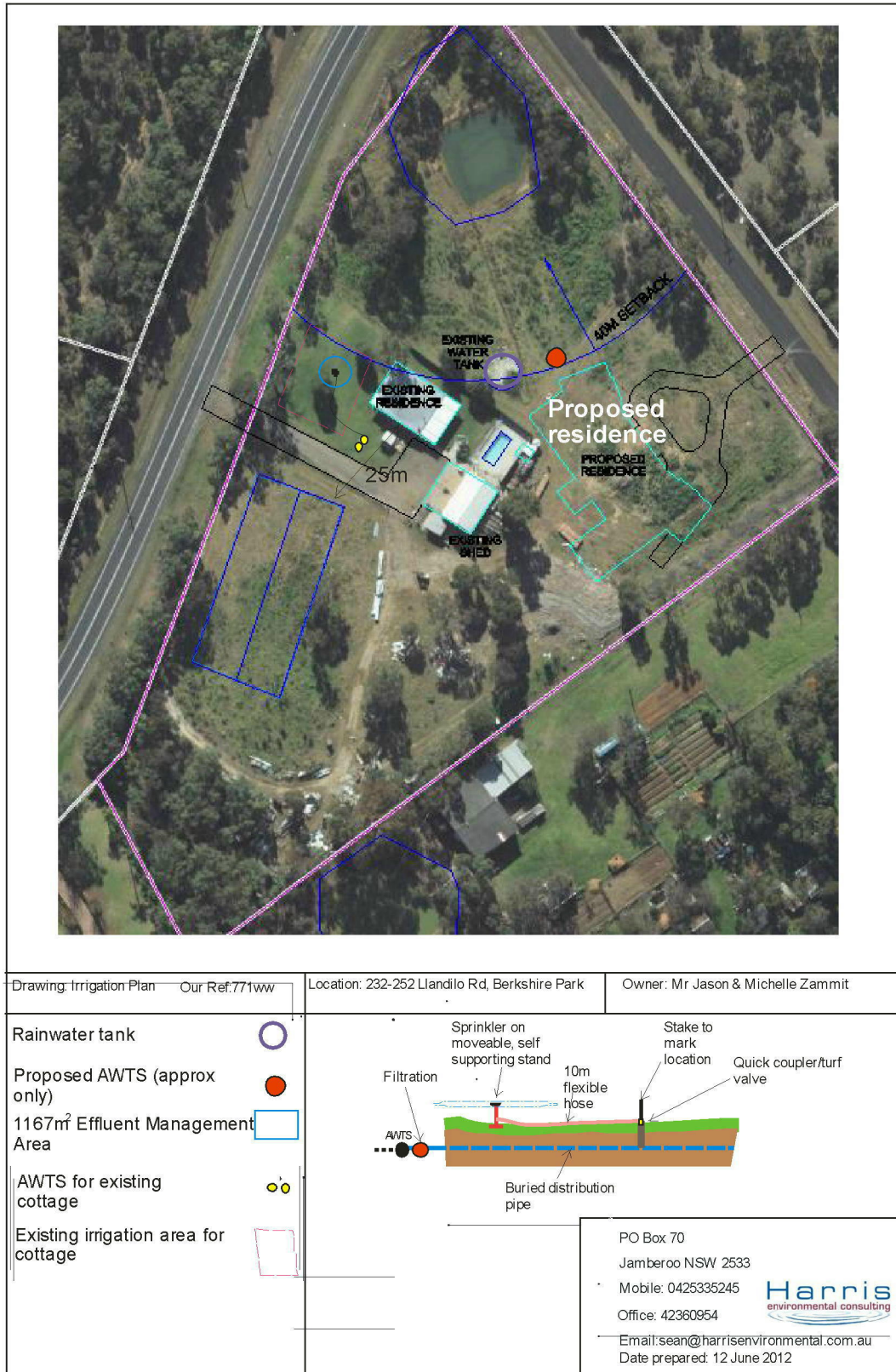


Figure 3 Irrigation layout



5. PROPOSED METHOD OF WASTEWATER TREATMENT

- 5.1 The owner must provide Council with the AWTS manufacturer's specifications of the Sewage Management Facility. (Information on proposed AWTS can be obtained from the manufacturer or NSW Health Register of Accredited Sewage Management Systems at http://www.health.nsw.gov.au/publichealth/environment/water/waste_water.asp).
- 5.2 The AWTS manufacturer will provide Council with the necessary plans and specifications including NSW Health Accreditation, tank dimensions and capacity, operation and maintenance details, plus Licensed Plumber's name, address, phone number and license number.
- 5.3 The AWTS will be installed and maintained in accordance with Section 5 of the guidelines 'On-site Sewage Management for Single Households' (Department of Local Government, 1998) and AS/NZS 1547-2012 'On-site Domestic Wastewater Management' (Standards Australia, 2012);
- 5.4 The location of the AWTS is shown on the Site Plan. The location is downslope of floor level and at least 2.5m away from proposed dwelling, 5m from the property boundary and 6m downslope of any in ground water storage tanks. There are other locations that are equally suitable, so this should not be considered a fixed location;

6. AREA REQUIRED FOR EFFLUENT DISPOSAL

- 6.1 The irrigation area required for a 6 bedroom residence is determined by Table 3 of the Penrith City Council's *On Site Sewage Management Policy*. The irrigation area was sized for a 6 bedroom residence, with reticulated water supply on clay soils.
- Effluent Disposal Area = 588m²
 - Effluent Management Area = 1167m²

7. EXISTING WASTEWATER TREATMENT SYSTEM

- 7.1 The existing residence uses an AWTS for wastewater treatment and spray irrigation for wastewater disposal. Harris Environmental Consulting was advised by the owner that Council inspected the AWTS within the last 2 years and Council had no issues of concern.

8 GENERAL ADVICE FOR IN HOUSE WATER MANAGEMENT

- 8.1 Chemical cleaning compounds and other chemicals that enter the treatment system should be low in phosphate non-antibacterial. Detergents low in phosphorus and sodium should be used to reduce salt and nutrient loadings;
- 8.2 Insinkerator style kitchen garbage disposal units should be avoided as they increase water consumption and raise the nutrient and BOD concentrations of household effluent;

- 8.3 Water conservation can reduce the volume of wastewater that needs to be treated and discharged on site. Water reduction fixtures will also be required to conform to BASIX, which requires a 40% reduction below average rates of water consumption. The following AAA-rated would help achieve this:
- Dual flush toilets (6/3L)
 - Aerator taps
 - Shower heads that limit flow to no more than 6L/minute
 - Dishwashers that use no more than 18 litres per wash cycle
 - Washing machines that use no more than 22 litres per dry kg of clothes

9. SUMMARY

This assessment recommends the following:

- Aerated Wastewater Treatment System to treat domestic wastewater from the proposed 4 bedroom residence (+ 2 potential bedrooms);
- 588m² Effluent Disposal Area within 1167m² Management Area using semi fixed spray irrigation;
- Install standard water saving fixtures.

10. REFERENCES

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

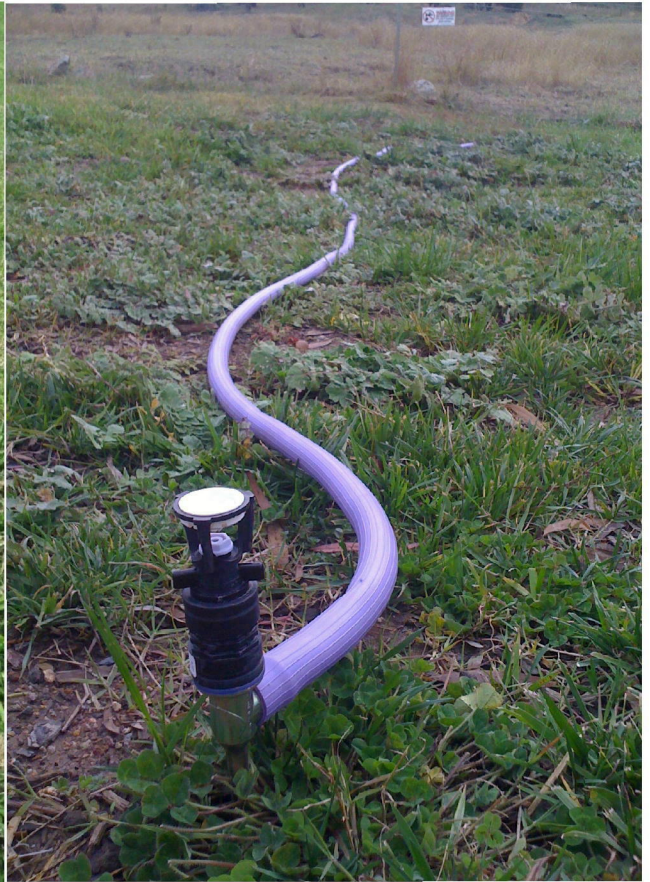
Standards Australia (2000) Australian/New Zealand Standard 1547:2000 *On-site domestic wastewater management*. Standards Australia.

Penrith City Council's On Site Sewage Management Policy.
http://www.penrithcity.nsw.gov.au/uploadedFiles/Website/Environment/Environmental_Management/OSMGR%20Policy.pdf

Appendix I Semi Fixed Spray Irrigation

- 1) Install filter after AWTS to protect sprinklers from blockages. Filter must be cleaned on a regular basis.
- 2) Install buried distribution pipe from AWTS to irrigation area. The pipe should be buried 300mm, except where vehicles pass over it should be 450mm for light traffic and 500mm for heavy traffic.
- 3) Install 4 quick coupling turf valves along buried distribution pipe.
- 4) Attach a 5m length of 19mm flexible pipe (purple wastewater pipe) to the quick coupling turf valves.
- 5) Attach sprinkler to the end of each flexible hose. The four sprinklers will be operated at the same time. Each sprinklers should be able to deliver a 4m diameter spray. Sprinkler are to be manually moved on a regular basis to ensure no areas are over watered.
- 6) The grass within the irrigation should be mown on a regular basis to ensure sprinklers can be seen through grass and any breakage or leaks can be seen and repaired. Dispose of clippings outside the irrigation area.
- 7) Fruit or salad vegetables should not be irrigated with effluent.
- 8) A warning sign complying with AS1319:1994 – Safety signs for the occupational environment should be located at the boundary of the designated area in one or two places, clearly visible to property uses, with wording such as, RECYCLED WATER, AVOID CONTACT, DO NOT DRINK’.

Example of turf valve, flexible 19mm poly pipe and a single wobbler (top right) and butterfly spray head (bottom).



Appendix II Penrith City Council, Table 3

Sizing of AWTS Disposal Areas

If an AWTS proposal complies with Table 2 and Table 3, a detailed Site and Soil Assessment will not be required. However, a detailed Site and Soil Assessment will be required if:

- The proposed system does not comply with the buffer distances outlined in Table 2 in section B3.
- Smaller irrigation/disposal areas are being proposed than those provided in the following table.
- Slope of the land exceeds 20%.
- The property has an existing system and additional systems are proposed.
- The proposal is part of a subdivision application.
- Systems are proposed within identified high risk areas.

The following disposal area sizes can also be utilised when upgrading to an AWTS or improving an existing system.

Table 3. Sizing of AWTS Effluent Management Areas and Effluent Disposal Areas.

Sizing of AWTS Effluent Management Areas and Effluent Disposal Areas					
Unsewered Penrith Suburbs	No. of Bedrooms	Surface and Sub-Surface Irrigation Areas (m ²)			
		Recirculated Water		Tank Water	
		EDA	EMA	EDA	EMA
Sandy Soil Types					
e.g. Agnes Banks - east of Castlereagh Road. Castlereagh - north of Devlin Road and east of Castlereagh Road.	4 or less	524	1048	408	815
	5	629	1258	489	978
	6	734	1467	571	1141
Clay Soil Types					
Most other areas	4 or less	420	833	327	648
	5	504	1000	392	778
	6	588	1167	457	907

Notes: (1) The Effluent Disposal Area (EDA) is the primary disposal area for the system, this area is to be located within the overall Effluent Management Area (EMA). The EMA provides further area for nutrient management and a possible reserve EDA.

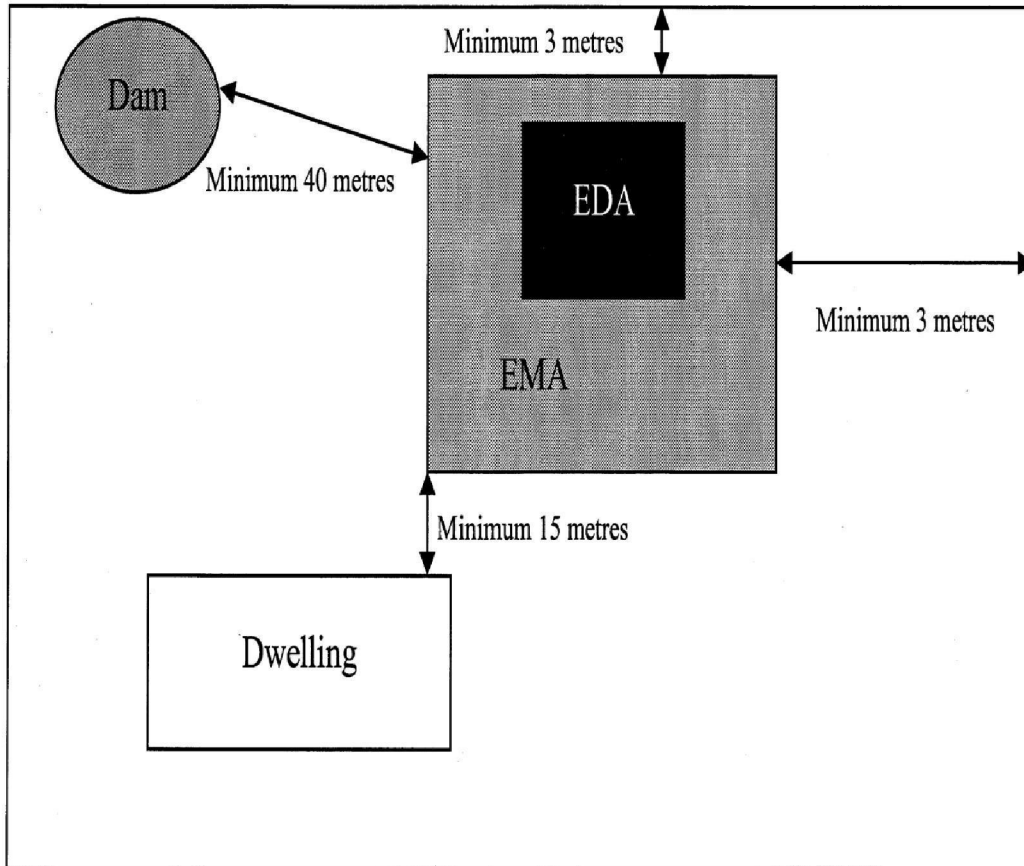
(2) EDA's for sandy soil types is half the EMA.

(3) Figures are based on:

- 180 litres per person/day, and 140 litres per person/day (for tank water areas)
- One person per bedroom and two for a master bedroom
- TN output value of 25 mg/L and a Critical Loading Rate of 27 mg/m²/day
- TP output value of 12 mg/L
- P sorption capacity - 600,000 mg/m²/depth for clay soil types and 400,000 mg/m²/depth for sandy soil types
- Design Irrigation rate of 15 mm/week for clay soil types and 35 mm/week for sandy soil types.

Appendix III PCC definition of EMA and EDA

Figure 1: Example of Effluent Management and Disposal Areas.



Please note: The above diagram is only an example of an Effluent Management Area (EMA) and Effluent Disposal Area (EDA) layout. All EMA's and EDA's are to be suitable designed and located for each individual situation and property. For flat sites the Effluent Disposal Area should be located in the middle of the Effluent Management Area. For sloped sites the EDA should be located on the upslope side of the EMA.

Branvel Developments Pty Ltd

Building Design & Drafting Service

P.O Box 121 Narellan NSW 2567

0408 968 201

info@branveldevelopments.com.au

External Finishes

Client: **Mr & Mrs Zammit** Date: **11/09/2012**

Building Address: **232-252 Llandilo Road Berkshire Park**

Brick Manufacturer: **PGH Bricks**
Main Colour: **Perisher new naturals selection**
Highlight Colour: **NIL**

Roof Tiles Manufacturer: **CSR**
Range: **Flat profile**
Colour: **Black**

Garage door: **Colorbond**
Colour: **Black**

Window Frames: **ALUMINIUM**
Colour: **Metallic Charcoal**

Fascia: **COLORBOND**
Colour: **Shale Grey**

Guttering: **COLORBOND**
Colour: **Shale Grey**

Down Pipes: **COLORBOND**
Colour: **Shale Grey**