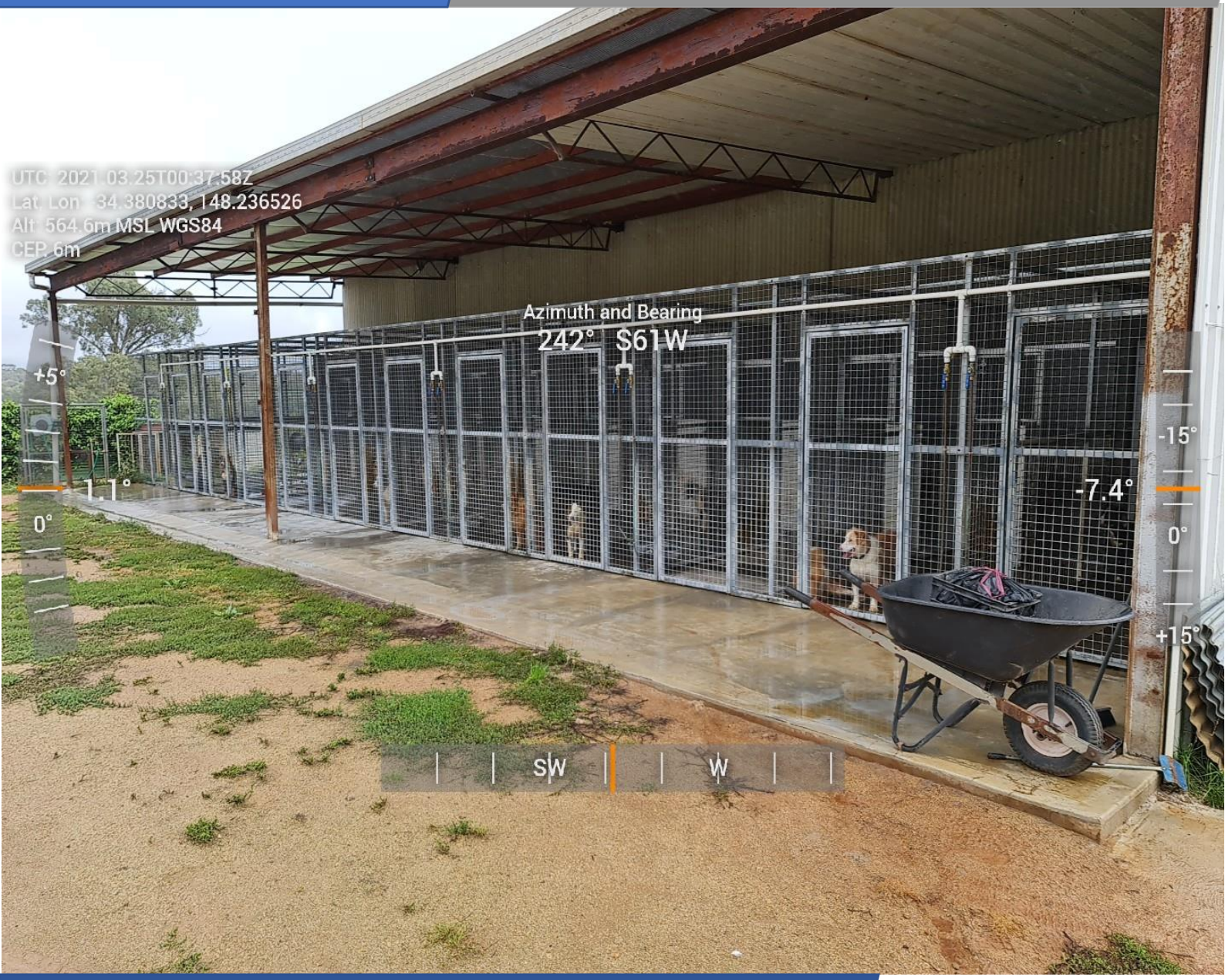
# ON-SITE SEWAGE MANAGEMENT REPORT

251 Rhodes Road
YOUNG NSW
Lot 12 DP 1058766

13 APRIL 2021
VERSION 1





FRANKLIN CONSULTING AUSTRALIA PTY LIMITED

abn 59 611 394 953 acn 611 394 953
po box 837 canberra act 2601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*Principal Consultant*
*John Franklin M App Sc, BSc, EIANZ, CEnvP*

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Contact details: GPO Box 837
Canberra ACT 2601
P 02 6179 3491
M 0490 393 234
admin@soilandwater.net.au
www.soilandwater.net.au

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# CONTENTS

# SUMMARY RECOMMENDATIONS

**Development:**

Operation of a dog breeding/boarding facility comprising:

- 12 whelping/boarding pens

on Lot 12 DP 1058766, 251 Rhodes Road, Young, NSW 2594.

**Expected wastewater load/day:**

**Whelping/Boarding Facility[1]:** Cleaning using water saving pressure washer at 5L/minute.

- 12 Pens at 6 minutes each = 72 minutes. 72min x 5 =360L.
- Food preparation bowl at 1L per bowl. Allowance = 24L.
- General washing and cleaning 100L
- Total peak flow = 360 + 24 + 100 = **484L/day**

**Total Daily Load: 500L/day**

**Recommended treatment system:** Primary Treatment System (NSW Health Accredited).

[Refer to Table 1 of NSW Health accredited primary treatment systems in this report.]

**Recommended effluent dispersal system:** Treated effluent will be disposed of by subsoil absorption to a minimum base area of **40m²**.

**Special conditions/comments:** The overflows from the rainwater tanks upslope of the subsoil absorption bed should be directed around the absorption area with an upslope earth diversion bank.

[1] Figures provided in Effluent Disposal Investigation for another facility developed by the same client- *Effluent Disposal Investigation Dog Breeding Facility and Existing Dwelling 120 Salisbury Road, Bigga NSW 2583*

# PROJECT DESCRIPTION

This site and soil assessment informs the appropriate on-site management of domestic effluent associated with the operation of a dog boarding/breeding facility including 12 pens, at 251 Rhodes Road, Young, NSW.

The site is a free draining site with a gentle southerly slope. The proposed effluent disposal area is located relatively close to the eastern boundary on an elevated area of the property. The property is bordered on all sides by rural blocks.

Drainage is through overland flow in the vicinity of the proposed effluent dispersal site.

The site is extensively cleared with groundcover of improved grazing pasture.

The site and soil conditions are well suited for a primary treatment system with effluent disposal of treated effluent through subsoil absorption.

There is an adequate area suitable for the disposal of primary treated effluent through subsoil absorption in accordance with the prescriptions contained in this report.

# REPORT SCOPE AND TECHNICAL REFERENCES

The report assesses land in the vicinity of the development to identify specific areas suited to the on-site disposal of effluent associated with the connection of a dog kennel facility.

**NB: The existing dwelling on the property has a separate effluent management facility which will not be impacted by the kennel facility.**

This involves excluding land with major physical constraints such as steep slopes, rocky outcrops, poor drainage, areas within buffer distances of property boundaries watercourses, storages, flow lines and existing and proposed buildings.

All information required by the approving authority, usually regional Councils, is contained in this report, including suitable types of sewage management systems, management prescriptions, site plan and photographs, with supporting information in this report including nutrient balance and limitation tables.

The report also refers to, or relies on, standards and technical references listed below.

*On-site Sewage Management for Single Households* (The Silver Book) NSW Govt, 1998.

*AS/ANZ Standard 1547:2012 On-site Domestic Wastewater Management.*

*Young Local Environment Plan 2010*

*Soil Landscapes of the Cootamundra 1:250,000 Sheet.* Anderson K. and McNamara M. (2009) Department of Environment, Climate Change and Water, Sydney.

*Effluent Disposal Investigation Dog Breeding Facility and Existing Dwelling 120 Salisbury Road, Bigga NSW 2583*

# LOCATION

## Site Location

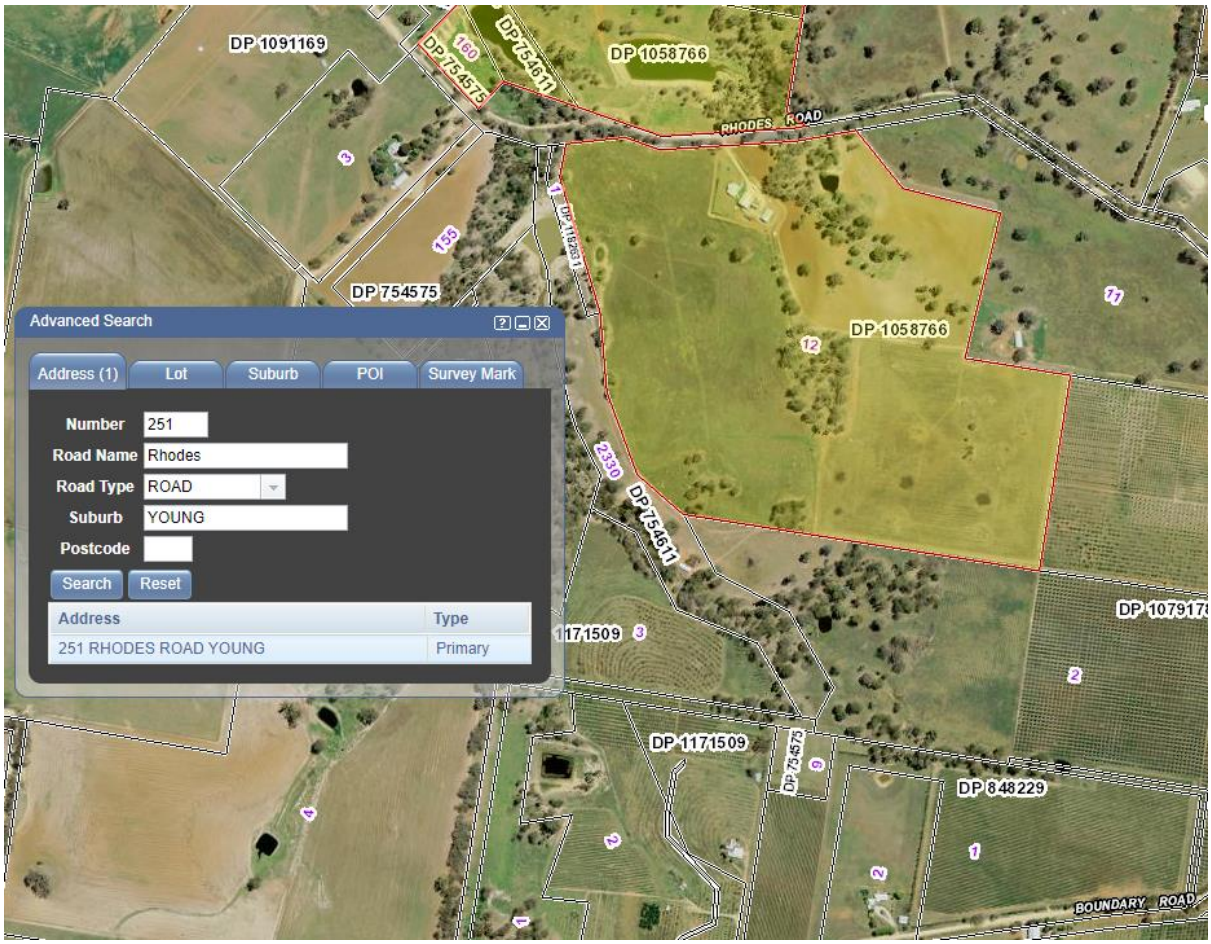



**Figure 1: Lot 12 DP 1058766**

### Landscape

The landscape is identified as the Young Soil Landscape Unit and includes undulating low hills formed on Silurian granodiorite parent material. Local relief is 30-80 m with gentle slopes of 3-10% and elevations of 460-557 m.

The local landscape is extensively cleared for grazing, cropping and horticulture with scattered remnant native trees and shrubs.

### Soils

Detailed soil profile descriptions are provided in **Appendix 1** of this report.

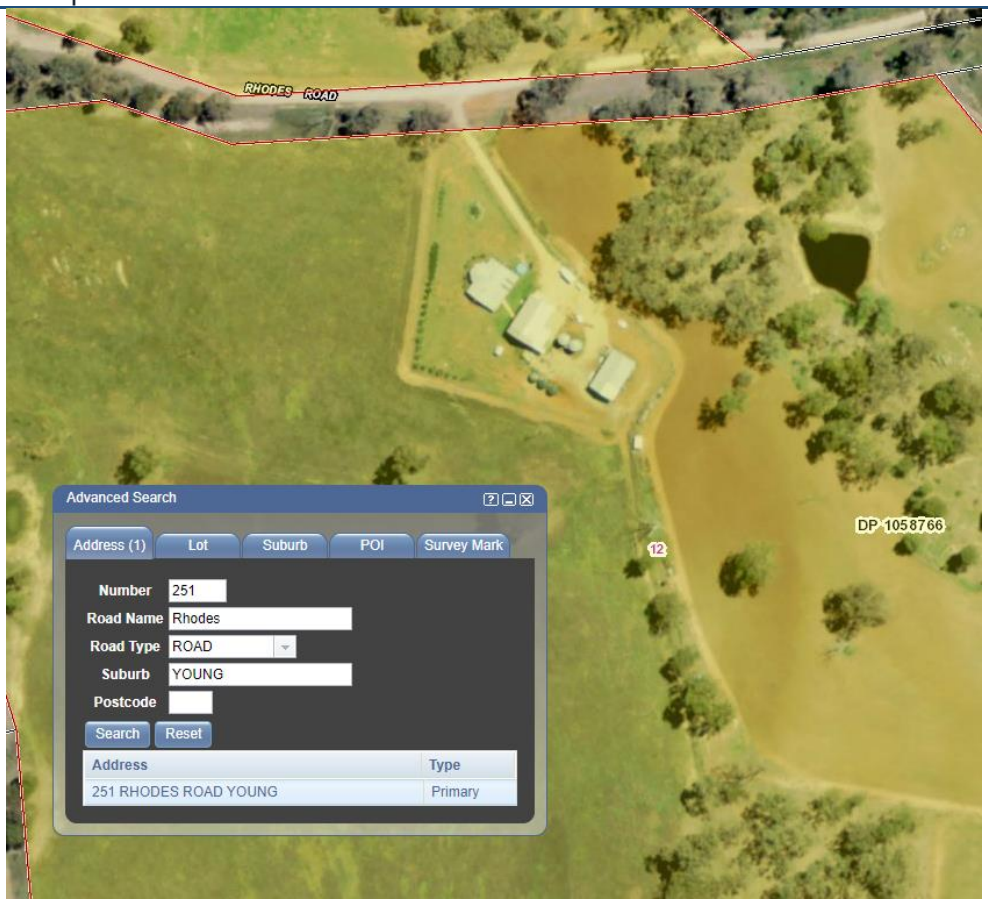
Moderately well drained and moderately deep Red Dermosols are present in the area identified for subsoil absorption.

These soil types are part of the Young Soil Landscape Unit and are comprised of a medium brown silty loam topsoil overlaying red silty clay loam. Depths extend beyond 100cms.

The Young Soil Landscape Unit is comparable with the Williamsdale Soil Landscape Unit from *Soil Landscapes of the Canberra 1:100,000 Sheet.* The analytical data for the Williamsdale Landscape in the survey report shows variable phosphorous sorption levels across the levels of the profile ranging from moderate to high. Soils are non-saline subsoils and low exchangeable sodium. As such the soils are free of any significant chemical limitations to effluent dispersal via absorption.

# SITE INFORMATION

**Address** Lot 12 DP 1058766, 251 Rhodes Road, Young NSW 2594.

| | |
|---|---|
| **Owners/ Builder** | Lucy Hammond |
| **LGA** | Hilltops Council |
| **Block configuration:** plans attached photo attached |  |
| **Intended water supply** | Non-reticulated - potable water to be supplied by roof catchment with tank storage. |
| **Expected wastewater load** (volume in litres/day) | **Boarding/Breeding Facility[2]:**<br>Based on cleaning using water saving pressure washer at 5L/minute:<br>• 12 pens at 6 minutes each = 72 minutes. 72min x 5 =360L.<br>• Food preparation bowl at 1L per bowl. Allowance = 24L.<br>• General washing and cleaning 100L<br>**Sub-total – 484L/day**<br><br>**Total Daily Load: 500L/day** |

[2] Figures provided in Effluent Disposal Investigation for another facility developed by the same client- *Effluent Disposal Investigation Dog Breeding Facility and Existing Dwelling 120 Salisbury Road, Bigga NSW 2583*

| | |
|---|---|
| **Local experience** | Most primary treatment and subsoil absorption systems work adequately in the area provided they are on appropriate soil and site conditions and are effectively managed.<br><br>The dwelling associated with the facility has an existing septic tank and subsoil absorption system which is working effectively. |


**Figure 2: 12 dog pens in shed facility**


**Figure 3: Looking east from the treatment system site towards the dog pens**


**Figure 4: Looking across the effluent disposal site**


**Figure 5: Water tank outlets to be diverted around the absorption bed**

# SITE ASSESSMENT

| | |
|---|---|
| **Climate** | The climate is typically a cool and moderately dry climate. Mean annual rainfall is 720.4 mm with a mean of 67 rainfall days (falls exceeding 1 mm).<br><br>Warm summers have large evaporative deficit, with cool winters averaging a small evaporative deficit across most months.<br><br>***Climate is suitable for the subsoil absorption of primary treated effluent*** |
| **Rainfall water balance attached** | Yes |
| **Land application area calculated** | Yes |
| **Wet weather storage calculation attached** | NA |
| **Flood potential**<br>land application area above 1:20 year flood:<br>land application area above 1:100 year flood:<br>electrical components above 1:100 year flood: | <br>Yes<br>Yes<br>Yes |
| **Exposure** | Site has no topographical shelter and no vegetative shading.<br><br>***Exposure is suitable for the subsoil absorption of primary treated effluent.*** |
| **Slope** | The effluent dispersal site is proposed for gentle south sloping site of 5-6%.<br><br>***Slopes are not a constraint to the disposal of effluent through subsoil absorption bed.*** |
| **Landform** | Slope form of the site is flat to divergent in the proposed effluent disposal areas.<br><br>***Landform is suited to the disposal of primary treated effluent through subsoil absorption.*** |
| **Run-on** | Run-on water will impact the effluent disposal site due to the upslope water tank overflows entering the site.<br><br>***Run-on water will be a constraint to the effluent disposal site and will be diverted around the area with an upslope earth diversion bank.*** |
| **Seepage** | ***No seepage*** was evident on the property. |

| | |
|---|---|
| **Erosion potential** | The site has limited erosion potential due to the low slope and good groundcover of grasses and pasture species.<br><br>***The erosion risk will be managed through the maintenance of good groundcover, particularly in and around the effluent disposal areas.*** |
| **Site drainage** | The effluent disposal site drains through the overland flow. Minor drainage depressions including a farm dam are located downslope of the effluent disposal site which will require a 40m buffer.<br><br>***There is a minor drainage depression including a dam located west of the effluent disposal area which will require 40 buffer.*** |
| **Fill** | ***No fill*** is proposed in the areas to be used for effluent irrigation. |
| **Groundwater**<br>Horizontal distance to groundwater well used for domestic supply:<br><br>Groundwater vulnerability map category:<br><br>Bores in area and purpose: | There are no known wells used for potable water in the vicinity.<br><br>  <br><br>https://realtimedata.waternsw.com.au/<br><br>The area is mapped as Moderate Groundwater Vulnerability in the Lachlan Catchment Groundwater Vulnerability Map (DLWC)<br><br>There are no registered bores within 500m of the effluent irrigation area. The closest bore (GW025255) is located 560 metres north west of the site.<br><br>***The effluent management practices proposed in this report will not impact this bore or the groundwater aquifer due to the horizontal*** |

| | |
|---|---|
| | ***separation of >500m, low transmissivity of fractured rock aquifer systems and low application rate of primary treated effluent to the near surface.*** |
| **Buffer distance from treatment system to**<br>Perennial rivers and creeks:<br>Drainage depressions:<br>Other sensitive environments:<br>Boundary of premises:<br>Dwelling:<br>Swimming pools:<br>Buildings:<br>*[Buffers distances as per Table 5, Silver Book]* | <br>NA<br>40 m<br>250 m (bore)<br>12/6 m (downslope/upslope boundary)<br>3/6 m (from upslope/downslope dwellings)<br>NA<br>3/6 m (from upslope/downslope buildings) |
| **Is there sufficient land area for**<br>Application system including buffers:<br>Reserve application system: | <br>Yes<br>Available<br>Refer **Figures 6 & 7** |
| **Surface rock outcrop** | ***No areas of outcropping rock in the vicinity of the proposed effluent disposal site*** |

# SOIL ASSESSMENT

| | |
|---|---|
| **Depth to bedrock or hardpan:** | >1.5 m |
| **Depth to high soil water table:** | >1.5 m |
| **Hydraulic loading rate**<br>Soil texture:<br><br>Soil structure:<br><br>Permeability *(from table L1 of AS1547:2012)*:<br>Recommended design irrigation rate for irrigation system<br>*(from table L1 of AS1547:2012)*: | <br>Silty loam topsoil underlain by silty **clay loam**<br>Weak to moderate in topsoil and **moderate** in subsoil<br>0.5 – 1.5 m/day<br><br>10 mm/day |
| **Coarse fragments:** | 5-10% |
| **Bulk density (a):** | 1.4 t/m$^3$ |
| **pH field (a)** | 4.8 in topsoil, 6.5 in subsoil |
| **Electrical conductivity dS/m (a)** | 0.2 in topsoil, 0.3 in subsoil |
| **Exchangeable sodium %(a)** | 3 in topsoil, 2 in subsoil |
| **Cation exchange capacity (mequiv/100g) (a)** | 15 in topsoil, 9 in subsoil |
| **Phosphorous sorption capacity mg/kg (a)** | 5000 (moderate) |
| **Geological feature**<br>Discontinuities:<br>Fractured rock: | <br>None<br>None |
| **Soil landscape reference (a):** | Williamsdale Unit (comparable soil landscape unit with the Young Unit) |
| **Dispersiveness EAT class (a):** | 8 in topsoil, 3(1) in subsoil |

(a) extrapolated from Jenkins (2000) *Soil Landscapes of the Canberra 1:100,000 Sheet*. DLWC

# SYSTEM SELECTION

| | |
|---|---|
| Consideration of connection to centralised sewerage system<br>Distance:<br>Potential for future connection:<br>Potential for reticulated water: | <br>>5 kms<br>None<br>None |
| Type of land application system best suited<br>Justification: | ***Subsoil absorption***<br>Suited to site and soil conditions and the proposed application of managing the wastewater generated from a dog breeding/boarding facility. Exposure and soil conditions are suited to subsoil absorption. |
| Type of treatment system best suited<br>Justification: | ***NSW Health accredited primary treatment system.***<br>Reliable system that is suited to site and soil conditions with no power requirements and minimal maintenance requirements. |

# EFFLUENT MANAGEMENT PRESCRIPTIONS

| | |
|---|---|
| **Effluent treatment** | The following site-specific recommendations are made in respect of the AWTS:<br>1. Effluent will be treated by a NSW Health accredited system capable of achieving primary standard treatment, refer to the following link for a list of accredited systems:<br>**http://www.health.nsw.gov.au/environment/domesticwastewater/Pages/default.aspx**<br>2. The treatment system tank should also be installed so that the lid remains at least 100 mm above final ground level to avoid stormwater entering the tank.<br>3. The final location for the AWTS unit should be chosen by the installer, in consultation with the client, and provide a minimum 3 m buffer from the dwelling or other buildings – an indicative location is provided in **Figure 6 & 7**.<br>4. AWTS tanks should be installed in compliance with the manufacturer's recommendations, 'AS/NZS 3500.2:2003 Plumbing and Drainage Part 2 Sanitary Plumbing and Drainage' and Council requirements. |
| **Effluent dispersal** | Effluent will be dispersed via an absorption bed. The following specific management practices should be implemented to ensure effluent is appropriately treated:<br>1. The absorption bed should be located on land shown as suitable in **Figure 6 & 7**.<br>2. An absorption area with a basal (floor) area of 40 $m^2$ is required. This can be achieved by the installation of a single absorption bed of 20 m length and 2m width. A typical design is provided in **Figures 8.**<br>3. The effluent can be delivered in a perforated pipe bedded in clean durable 20-40 mm aggregate, or through a self-supporting arch pipe (e.g.Reln drain) backfilled with aggregate.<br>4. The 20 m absorption bed should be fed by two delivery lines (perforated pipe or self-supporting arches) which are spaced at 500 mm from the edge of the bed with 1000 mm between the delivery lines.<br>5. The two delivery lines should be joined such that effluent is distributed evenly between each. This can be achieved using a proprietary distribution box (e.g. Everhard) or a splitter comprising a level T piece with outlets as required.<br>6. The bed should be excavated parallel to the contour so the floor of the trench has a grade of 0-1% to ensure an even spread of effluent along the length of the trench.<br>7. The excavation should have a total depth of 400 mm comprising a wetted depth of 250 mm and a 150 mm cover of topsoil.<br>8. Geotextile should be placed between the aggregate in the bed and the covering of topsoil.<br>9. Excess spoil from the excavated bed should be used to create a diversion bank around the topside of the bed. The bank should be 300 mm in height and have a grade of 2-3% which outlets well away from the bed area.<br>10. The topsoiled bed should be planted with perennial grasses and slashed/mown regularly.<br>11. Landscaping around the bed, particularly on the downslope, can provide for the additional utilization of effluent discharged to the bed. Suitable species include Callistemon pallidus, C. palludosis, Kunzea ericoides, K. parvifolia, K. phyllicoides (burgen), Leptospermum continentale (prickly ti tree), L. multicaule, L. flavescens, |

| | |
|---|---|
| | L. squarrosum, Melaleuca armillaris (honey myrtle), M. decussata, M. squamea, M. thymifolia, M. ericifolia, M. hypericifolia, M. linariifolia.<br>12. The following buffers will be applied to the absorption bed: 12 m from downslope boundary, 3 m from upslope buildings and driveways and 40 m from drainage depression and dam. |
| **Special Conditions** | 1. The effluent distribution line from the treatment system to the subsoil absorption bed should be buried a minimum of 300mm deep and 450mm where vehicular traffic may impact the line.<br>2. The following measures should be adopted for the management of the kennels:<br>**MAINTENANCE OF BOARDING AREA**<br><br>General recommendations as per NSW Animal Welfare Code of Practice No 5:<br>All collection & wash down drainage pits should contain a fine mesh wire basket to trap hair and waste. Drainage should be located on all four sides of the whelping shed and kennels and directed towards a suitably located AWTS tank. These baskets should be cleaned daily and particularly after the bays are washed down. The outdoor boarding facilities should have faeces removed at least once daily and disposed of in an environmentally sound manner into the tank on site or via collection.<br><br>Cleaning and disinfecting agents should be chosen on the basis of their suitability, safety and effectiveness, and used to manufacturer's guidelines. Chlorine based low phosphate cleansers or similar are recommended, and they be applied then wiped down with paper towel or similar and the toweling be disposed of as solid waste. Applying disinfectant or cleanser and immediately washing down the area is not recommended as this will have a negative effect on the septic tank microbial bacteria. Disinfecting should be performed weekly. Care should be taken with any cleansers used in the general washing or prep area as these will also have an effect on the performance of the septic tank. |
| **General** | 1. Stock and vehicular access must be excluded from the irrigation area as they compact the soil, thereby reducing the infiltration rate and water holding capacity.<br>2. Water conservation measures should be adopted to the greatest extent possible in the kennel facility.<br>3. Detergents low in phosphorous and sodium should be used as much as possible (see details in appendix) in order to protect the soil's capacity to absorb water. |


**Figure 6: Property Constraints**


**Figure 7: Site Constraints and System Layout**

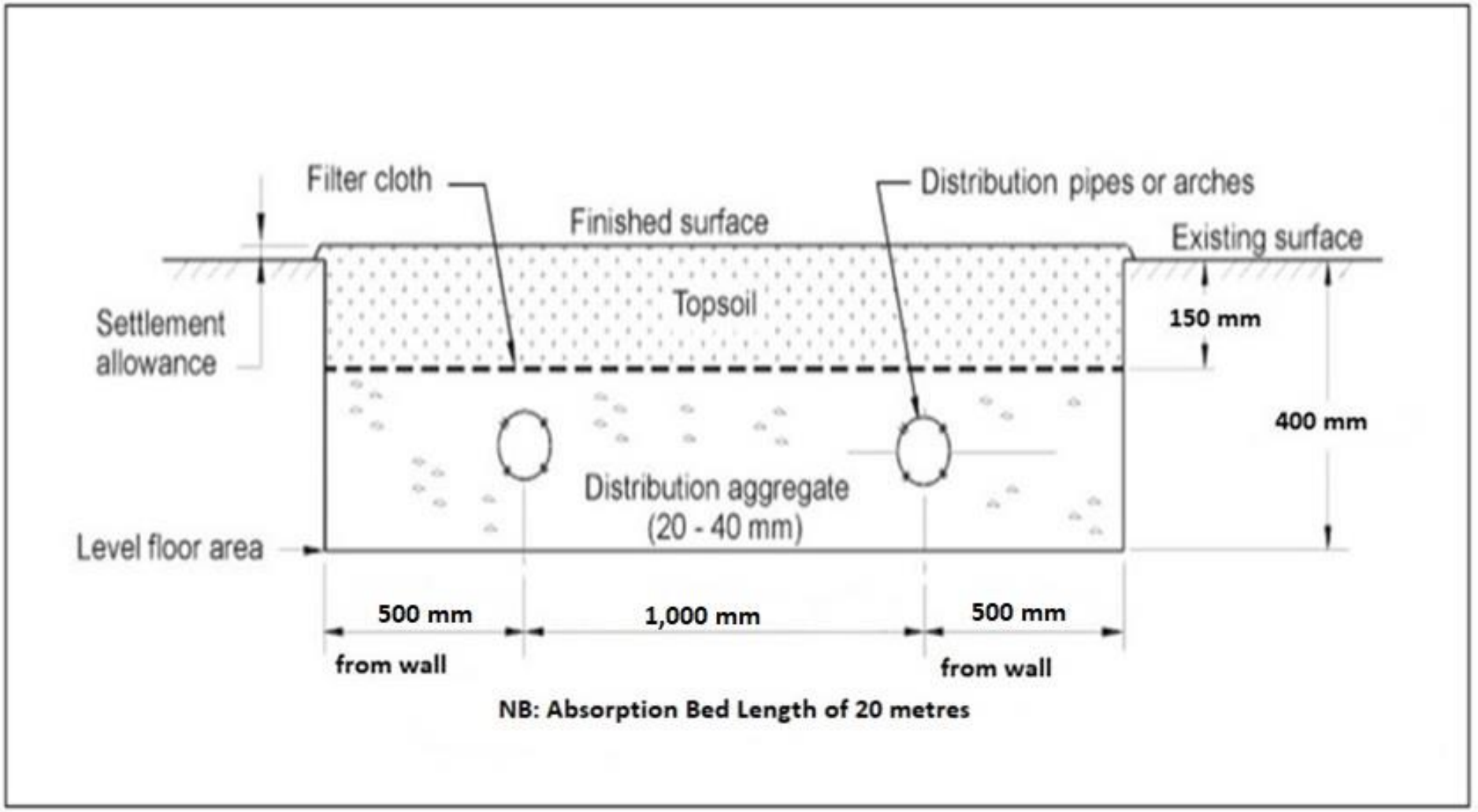



**Figure 8: Absorption Bed Design**

# SIZING EFFLUENT DISPOSAL AREA

Using the DLR for subsoil absorption on moderately structured clay loam soils of 15 mm/day and design loading of 500 L/day, the following land application areas are required to manage additional hydraulic loading, nitrogen and phosphorous generated.

| | |
|---|---|
| Water balance | **Sizing based on hydraulic loading:**<br>A = Q (l/day)/DLR (mm/day)<br>*where A = area; Q = 500 l/day; DLR = 15 mm/day*[3]<br>A = 500/15 = 33.3 $m^2$<br>**Area required = 40 $m^2$** |
| Design effluent disposal area | Therefore, a subsoil absorption area of **40 $m^2$** will account for phosphorous, nitrogen and water applied based on connection of the 12 pen kennel facility. |

[3] The maximum application rate has been adopted given the treatment system is servicing a small kennel facility with limited faecal matter or other solids entering the system and being directed to the subsoil absorption bed.

## SITE AND SOIL LIMITATION ASSESSMENT

The following two limitation tables are a standardised guide to the site and soil characteristics which may limit the suitability of the site for effluent disposal and which would require attention through specific management practices. The tables have been reproduced from *On-site Sewage Management for Single Households* (tables 4 and 6, Anon, 1998). The highlighted categories represent site and soil conditions of the land covered in this report. The tables show that the land designated for effluent application has slight to moderate limitations, but no severe limitations.

**Site limitation assessment**

| Site feature | Relevant system | Minor limitation | Moderate limitation | Major limitation | Restrictive feature |
|---|---|---|---|---|---|
| **Flood potential** | All land application systems | > 1 in 20 yrs. | | Frequent, below 1 in 20 yrs | Transport in wastewater off site |
| | All treatment systems | components above 1 in 100 yrs. | | Components below 1 in 100 yrs. | Transport in wastewater off site, system failure |
| **Exposure** | All land application systems | High sun and wind exposure | | Low sun and wind exposure | Poor evapo-transpiration |
| **Slope %** | Surface irrigation | 0-6 | 6-12 | >12 | Runoff, erosion potential |
| | Sub-surface irrigation | 0-10 | 10-20 | >20 | Runoff, erosion potential |
| | Absorption | 0-10 | 10-20 | >20 | Runoff, erosion potential |
| **Landform** | All systems | Hillcrests, convex side slopes and plains | Concave side slopes and foot slopes | Drainage plains and incised channels | Groundwater pollution hazard, resurfacing hazard |
| **Run-on and seepage** | All land application systems | None-low | Moderate | High, diversion not practical | Transport of wastewater off site |

| Site feature | Relevant system | Minor limitation | Moderate limitation | Major limitation | Restrictive feature |
|---|---|---|---|---|---|
| **Erosion potential** | All land application systems | No sign of erosion potential | | Indications of erosion e.g. rills, mass failure | Soil degradation and off-site impact |
| **Site drainage** | All land application systems | No visible signs of surface dampness | | Visible signs of surface dampness | Groundwater pollution hazard, resurfacing hazard |
| **Fill** | All systems | No fill | Fill present | | Subsidence |
| **Land area** | All systems | Area available | | Area not available | Health and pollution risk |
| **Rock and rock outcrop** | All land application systems | <10% | 10-20% | >20% | Limits system performance |
| **Geology** | All land application systems | None | | Major geological discontinuities, fractured or highly porous regolith | Groundwater pollution hazard |

## Soil limitation assessment

| Soil feature | Relevant system | Minor limitation | Moderate limitation | Major limitation | Restrictive feature |
|---|---|---|---|---|---|
| **Depth to bedrock** | Surface and sub surface irrigation | > 1.0 | 0.5-1.0 | < 0.5 | Restricts plant growth |
| **or hardpan (m)** | Absorption | > 1.5 | 1.0-1.5 | < 1.0 | Groundwater pollution hazard |
| **Depth to seasonal water table (m)** | Surface and sub surface irrigation | > 1.0 | 0.5-1.0 | < 0.5 | Groundwater pollution hazard |
| | Absorption | > 1.5 | 1.0-1.5 | < 1.0 | Groundwater pollution hazard |
| **Permeability** | Surface and sub surface irrigation | 2b, 3 and 4 | 2a, 5 | 1 and 6 | Excessive runoff and waterlogging |
| **Class** | Absorption | 3, 4 | | 1, 2, 5, 6 | Percolation |
| **Coarse fragments %** | All systems | 0-20 | 20-45 | >40 | Restricts plant growth, affects trench installation |
| **Bulk density (g/cc)**<br>**SL**<br>**L, CL**<br>**C** | All land application systems | <br><br>< 1.8<br>< 1.6<br>< 1.4 | | <br><br>> 1.8<br>> 1.6<br>>1.4 | restricts plant growth, indicator of permeability |
| **pH** | All land application systems | > 6.0 | 4.5-6.0 | - | Reduces plant growth |
| **Electrical conductivity (dS/m)** | All land application systems | <4 | 4-8 | >8 | Restricts plant growth |
| **Sodicity (ESP)** | Irrigation 0-40cm; | 0-5 | 5-10 | > 10 | Potential for structural degradation |

| Soil feature | Relevant system | Minor limitation | Moderate limitation | Major limitation | Restrictive feature |
|---|---|---|---|---|---|
| | absorption 0-1.2mtr | | | | |
| **CEC mequiv/100g** | Irrigation systems | > 15 | 5-15 | < 5 | Nutrient leaching |
| **P sorption kg/ha** | All land application systems | > 6000 | 2000-6000 | < 2000 | Capacity to immobilise P |
| **Aggregate stability** | All land application systems | Classes 3-8 | class 2 | class1 | Erosion hazard |

# Appendix 1: Soil Profile Description

**Soil Profile 1: Effluent dispersal area**

| Soil classification | Depth (cm) | Properties |
|---|---|---|
| RED DERMOSOL | 0-45 | A Brown silty loam, moist and friable, weak to moderate structure, no coarse fragments, gradual colour and texture change to |
| | 30->100 | B Red silty clay loam, moist and friable, weak to moderate structure, no coarse fragments, continues |


**Figure 9: Soil profile – effluent dispersal area**

NB: Soil profile is presented as an expanded profile (expansion factor approximately X2)

# Appendix 2: Supporting information

## Powder Laundry Detergents

### *What did we test?*

***Lanfax Laboratories*** purchased laundry detergents powders from supermarkets in Armidale, NSW (during late 2008) and a few samples were supplied, without charge, by various individuals to total 71 powders.

Samples of each of these products were mixed at two rates: one specifically for front loading washing machines (25 L); and one for top loading washing machines (60 L) to simulate the wash cycle of a normal wash program.

The rates of detergent were calculated from weighed samples of a known volume from a freshly opened packet and mixed at the manufacturer's recommended dose for a normal wash.

The samples were mixed with rainwater at the chosen dose and agitated for 30 minutes to replicate washing action. Samples were tested within one hour for pH and salinity. Other tests followed normal good laboratory practice.

### *Why carry out the tests?*

The quality of greywater from domestic dwellings is a cocktail from the numerous chemicals used in the home for personal and general cleaning. Perhaps the greatest use of chemicals is in the laundry where modern detergents are used at rates from a teaspoonful per wash to 1½ cups per wash. Manufacturers have their formulations and marketing strategies that mostly fail to address the problem of potentially hazardous chemicals. The impacts of pH, salinity, sodium, phosphorus and sulphur are not addressed in advertising. Most product labels don't state the ingredients, so astute purchasers can never be sure what is actually in the product. More importantly, very few even let you know how many washes in a packet. This research set out to address some of those shortcomings.

These data are not an endorsement of any product. ***Lanfax Labs*** has a policy of not endorsing or degrading any product.

No "safe in septic" standards or acceptable guidelines exit, and no laundry product can be "environmentally friendly".

The term "biodegradability" can only apply to the organic components of a powder detergent. When the detergent has a positive reading for Electrical Conductivity, you know immediately that inorganic components are included so the product cannot be "100% biodegradable".


## *Lanfax Laboratories*

ABN 72 212 385 096
493 Old Inverell Road
(PO Box 4690)
Armidale NSW 2350

Phone: +[61] 2 6775 1157
Fax:+[61] 2 6775 1043
Website: www.lanfaxlabs.com.au
Email:
lanfaxlabs@bigpond.com.au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***Principal Scientist:***

Dr Robert Patterson FIEAust, CPSS, CPAg


Lanfax Laboratories is an independent laboratory. This research was funded by Lanfax Labs and provided without charge to the public. 

NOTE: Product formulations may have changed since this research was undertaken. Lanfax Labs has no way of knowing which products may have changed and manufacturers have no requirement to advertise formulation changes to the public.

Lanfax Laboratories
ABN 72 212 385 096

## *Laundry Detergents*


***Research Results - 2009***

***Front Loading & Top Loading Powders***

## How to interpret the results

The graphs shown on these pages are examples of the numerous graphs available on the website.

### *Greywater pH*

pH is a measure of the acid or alkaline status of the liquid. Acids have a pH <7, while alkaline solutions have a pH>7. Natural systems prefer pH between 6 and 8.

High pH causes soil to disperse and where greywater is used for landscaping, a high pH may be detrimental to both the plants, soil microbes and the soil structural stability.

### *Phosphorus (symbol P)*

Phosphorus is an essential biological element and a non-renewable resource. It is an excellent component of modern detergents, but detrimental when discharged into waterways as it encourages growth of algae and bacteria ("blue-green algae"). When greywater is used for landscaping, plants can uptake the P and so reduce the need for P from other fertilisers. On sandy soils P may leach into groundwater. With care on heavy clay soils much of the P may be locked up in the soil and not be an environmental problem.

If your greywater system may impinge on a sensitive environment, you need to choose a product with a very low P. The "P" symbol on the packet is not a good indicator as some products marked "P" have relatively high levels of P. The "NP" symbol is a good indicator of extremely low (almost absent) P. See Figure F1 and T1 for P ratings.

### *Sulphur (symbol S)*

Sodium sulphate is often used as a "manufacturing" agent, in other words a "filler". Detergents high in sulphur are more likely to have ingredients that may not be essential to a clean wash. Usually there is no indication on the packet to suggest high proportions of "filler" other than a big bulky box. Choose a concentrate and one with a small dose.

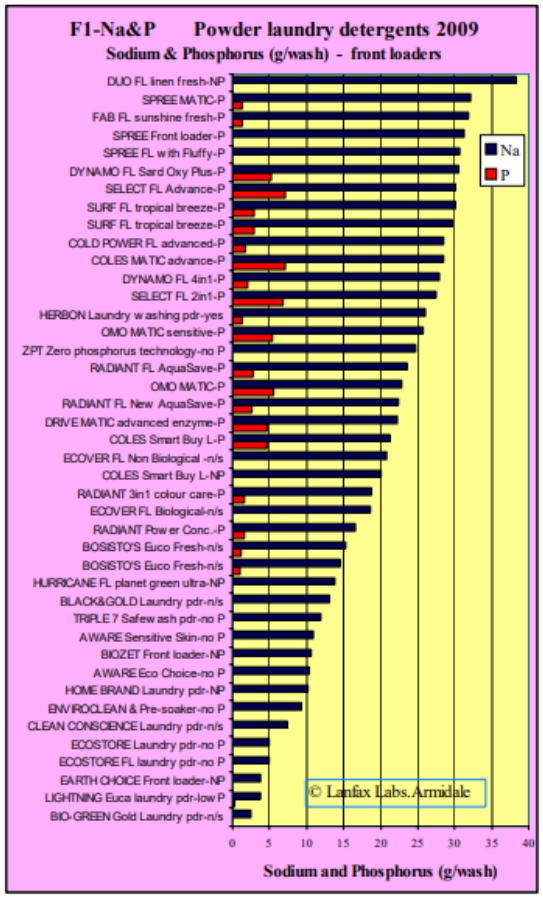
### *How much detergent to use.*

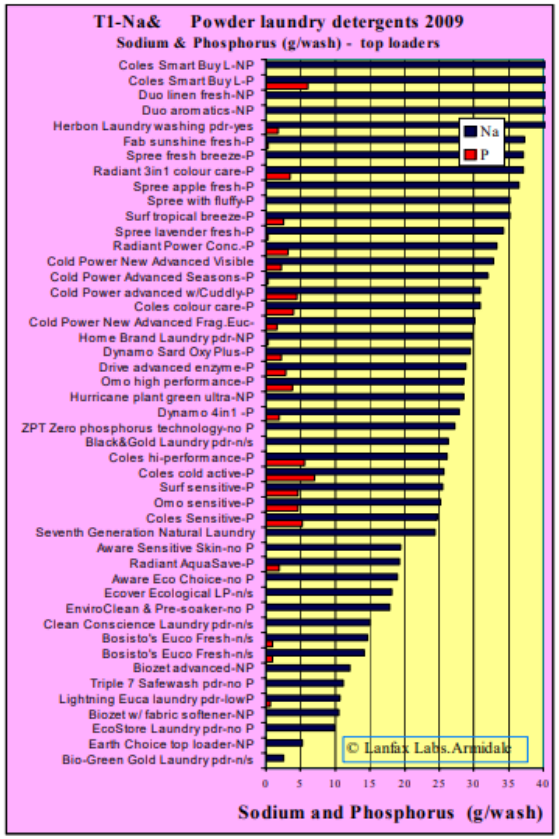
The "builder" in detergents (often sodium tripolyphosphate, or zeolite as a replacement) has to immobilise the "hardness" in water. Hardness is caused by calcium and magnesium in the water. Rainwater has almost none of these two elements and is "soft" water. Use less detergent than recommended in "soft" water. You may need to use more detergent in "very hard" water. How do you know if water is soft or hard?Hard water leaves a scum with soap.

### *Sodium (symbol Na)*

Sodium is an element essential for all life, however, in elevated concentrations leads to serious plant water stress and potential soil structural instability. Laundry detergents that contain more than 20 g sodium per wash may be detrimental to plants and soil structure. In the figures F1 and T1, the lower the sodium the better. Take care with products over 20 g Na/wash by spreading greywater over a larger area, or dilute with the rinse water.

When in doubt, choose low sodium and no phosphorus.




### *WASH and RINSE efficiency*

Whether you have a front loader or a top loader, the efficiency of the wash and rinse cycles are more important than the quantity of water used. Some powders are slow to fully dissolve so the particles will be difficult to wash from the clothes. Always try your own experiment and see how much detergent you need to a wash to your satisfaction. Be aware of great cleaning claims. Remember, the performance of your wash will depend upon the washing machine action, the hardness of your water, the temperature of the wash, and the quality of the detergent. They all go together for a clean wash.

**DO**

- ✓ Learn how your sewage management system works and its operational and maintenance requirements.
- ✓ Learn the location and layout of your sewage management system.
- ✓ Have your AWTS (if installed) inspected and serviced four times per year by an approved contractor. Other systems should be inspected at least once every year. Assessment should be applicable to the system design.
- ✓ Keep a record of desludgings, inspections, and other maintenance.
- ✓ Have your septic tank or AWTS desludged every three years to prevent sludge build up, which may 'clog' the pipes.
- ✓ Conserve water. Conservative water use around the house will reduce the amount of wastewater which is produced and needs to be treated.
- ✓ Discuss with your local council the adequacy of your existing sewage management system if you are considering house extensions for increased occupancy.

**DON'T**

- ✗ Don't let children or pets play on land application areas.
- ✗ Don't water fruit and vegetables with effluent.
- ✗ Don't extract untreated groundwater for cooking and drinking.
- ✗ Don't put large quantities of bleaches, disinfectants, whiteners, nappy soakers and spot removers into your system via the sink, washing machine or toilet.
- ✗ Don't allow any foreign materials such as nappies, sanitary napkins, condoms and other hygiene products to enter the system.
- ✗ Don't put fats and oils down the drain and keep food waste out of your system.
- ✗ Don't install or use a garbage grinder or spa bath if your system is not designed for it.

**Reducing water usage**

Reducing water usage will lessen the likelihood of problems such as overloading with your septic system. Overloading may result in wastewater backing up into your house, contamination of your yard with improperly treated effluent, and effluent from your system contaminating groundwater or a nearby waterway.

Your sewage management system is also unable to cope with large volumes of water such as several showers or loads of washing over a short period of time. You should try to avoid these 'shock loads' by ensuring water use is spread more evenly throughout the day and week.

**HELP PROTECT YOUR HEALTH AND THE ENVIRONMENT**

Poorly maintained sewage management systems are a serious source of water pollution and may present health risks, cause odours and attract vermin and insects.

By looking after your management system you can do your part in helping to protect the environment and the health of you and your community.

For more information please contact:

# Managing Wastewater In Your Backyard