

## Site and Soil Assessment

The field component of the Land Capability Assessment (LCA) for the design of an on-site wastewater system is to identify the proposed wastewater land application area (LAA). After allowing for structures such as house, shed, out-buildings and gardens, consider adequate buffers to boundaries, farm dams, creeks and environmentally sensitive areas. Identify an area that will minimise run-on impacts and reduce on-site constraints.

### Where to take soil samples?

Assess whether the surface features in the proposed LAA indicate a similar soil over the area or whether there may be several different soil types. Usually soil colour and plant species (and density) will give some indication. A sample of the representative soil profile is needed (i.e each horizon within).

### Who takes the sample?

It is important that the person who takes the sample follows some basic rules of soil sampling and can replicate the sampling procedure at a later date. For a single allotment, at least two inspection holes are required, sometimes more, although only one site may be sampled for analysis.

### What equipment is needed?

- soil auger, shovel or backhoe
- tape measure
- clean plastic sheet
- unused plastic bags and elastic bands
- masking tape and permanent marker



Please do not write on plastic bags with felt markers, the writing will rub off in-transit. Place a strip of masking tape on the bag and write on the tape, or use a label tie.

Each soil sample should have a unique identifier - site, horizon and depth, such as "site 1, horizon 1, 0-200 mm", or "1/1, 0-200 mm"

Other details you will need to keep for your records are:

- date soil samples taken, date dispatched
- location of excavation (GPS or map location)
- other details on each soil sample - depth, stoniness, moisture, groundwater

Complete the details overleaf and send with your samples.

## Lanfax Laboratories

### Independence

*Lanfax Labs* - an independent, commercial and research organisation with special interests in soil, water and wastewater analysis, effluent and greywater management.

### Quality Management Systems

*Lanfax Labs* successfully participates in a range of proficiency testing programs at the National level to ensure quality assurance using recognised methods and standard procedures for soil, water and plant analysis. All tests are performed according to approved methods and proficiency testing programs.

### Water Quality Analysis

*Lanfax Labs* provide a range of tests and assessments to Universities, Government Agencies, Local Authorities, commercial operators and individuals for:

- Drinking water, irrigation and stock water
- Groundwater impact assessment
- Wastewater reuse and recycling
- Greywater and stormwater management
- Domestic effluent and urban sewage
- Surface and river water monitoring
- Liquid Trade Waste
- Laundry detergent assessments

### Soil Physical and Chemical Properties

*Lanfax Labs* provide soil sample analysis for:

- Agricultural, pastoral & horticultural use
- Wastewater application - commercial and domestic
- Manure and biosolids application to land
- Land reclamation and subdivisions
- Salinity and Sodicity

### On-site Effluent Disposal

*Lanfax Labs* designs domestic on-site wastewater systems to meet Local Government regulations.

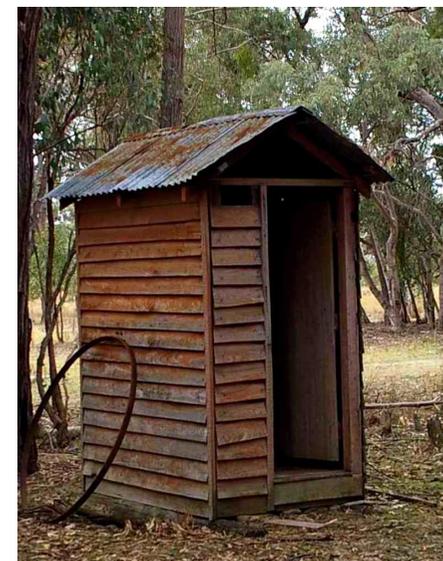
### Laundry Product Research & Greywater Reuse

*Lanfax Labs* has researched phosphorus and salinity components of laundry detergents. This information is published on our website, at no charge.



*Soil and Water Resource Consultants*

## Soil Analysis for On-site Wastewater Systems



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## Taking the sample

Figure 1 shows the soil excavated with a soil auger, laid out to show the various horizons. Be careful that you lay out the soil to reflect approximately the depth from which it came.



The top horizon is dark from organic material and decomposing vegetation. Often this horizon will be bound together by plant roots.

The second horizon will mostly be paler than surface, but may also be very pale compared with either the top or third horizon.

The third horizon is often the most clayey, and its colour may vary from red, to yellow to grey in soils developed on sediments or granites.

Figure 1. Soil profile

In heavy basalt soils, such as in flow lines, the soil may look reasonably uniform in all horizons. In this case simply sample from the top 200 mm, and then take a sample from about 600 mm deep and again at 900 mm deep to represent the profile.

When you have excavated the profile, identify the horizons based on colour or some distinguishing feature. In many areas, there will be three horizons within the first 1.0 m depth.

Take a sample of soil from each horizon. Discard any stones, rocks or plant material. Place a **good double-handful of soil** in a new plastic bag. Label the bag on the outside, writing on masking tape, recording a unique number for that horizon (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>) and the depth from which the sample was taken. **DO NOT** write on plastic with a marker, as the writing may rub off or smear and erase the identity of the sample.

Keep bagged samples out of the sun (reduces sweating of sample), and send samples to **Lanfax Labs** promptly.

## Sample collection

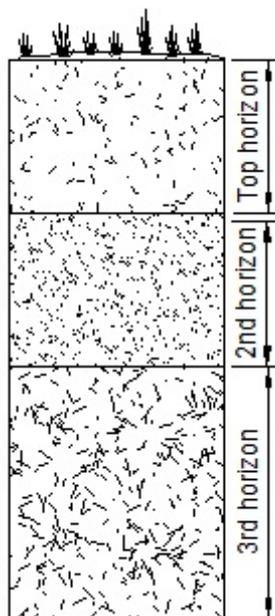


Figure 2 Typical profile

Keep these details for your records - do not send to lab.

Measure and record the depth of each horizon. Draw yourself a simple diagram to show the various horizons and their depths as shown in Figure 2.

Record depth from surface to the change in each horizon. Record other distinguishing features, such as mottling against each horizon.

Describe any gravel, stones by proportion of soil mix.

Record if any water enters the hole (usually wait about 20 min before making this assessment).

Take a photograph of the soil profile (as set out in Figure 1).

Make labels and show some scale.

Table 1. Tests carried out on the three horizons

Horizon	Tests
1, 2 & 3	pH (water), pH (CaCl <sub>2</sub> ), EC, salinity, exchangeable cations (Na <sup>+</sup> , K <sup>+</sup> , Ca <sup>2+</sup> , Mg <sup>2+</sup> , H <sup>+</sup> & Al <sup>3+</sup> ), ESP, CEC, Ca/Mg ratio, soil colour, soil texture, aggregate stability
3	5-point Phosphorus sorption rating

For the tests required for On-site Wastewater Assessment, samples can be up to a week old. Longer than this, the samples need to be air-dried and then will keep for months.

Tie off the top of the bag and check that label shows:  
 unique sample number  
 location (optional)  
 date sample taken

## Complete details and submit with sample

Name .....

Contact Phone No. ....

Email for sample results .....

Business Name .....

Address .....

Town ..... Post code .....

Date sample taken .....

Number of samples submitted.....

Special conditions (please state) .....

Check that each sample has a unique number and depth from which sample was taken, and you have recorded the location of that sample in your records (on a plan).

**Note:** Each set of samples consists of three soil samples, one from each horizon down the profile.

Results will be forwarded by email in a form that may be appended to your report. If only two horizons are included, the phosphorus sorption test will be done on the lower horizon, unless otherwise requested.

Australia Post provides an efficient service by either Express or ordinary mail. Armidale is outside the Express Delivery, even though you pay for it. Please address to **Lanfax Labs PO Box 4690 Armidale 2350**. Do not use our street address.

Turn-around time is usually 10 days from receipt of soils.

Cost: Each set of three samples costs \$480 including GST.

Prices apply from SEPTEMBER 2020