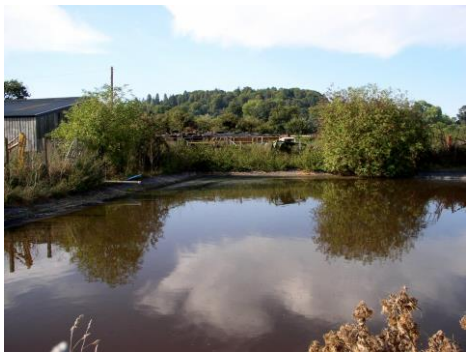
Fact sheet 5: for farmers

Earth bank slurry stores and tanks

November 2016

Are you planning to substantially alter your earth bank slurry store, or add a new one?



If so, this fact sheet will help you meet the requirements of The Water Resources (Control of Pollution) (Silage, Slurry and Agricultural Fuel Oil) (England) Regulations 2010 (as amended 2013). These are commonly referred to as SSAFO and apply in England.

We suggest you seek specialist advice on the design, construction and installation of the system. We also recommend you choose a contractor who is fully conversant with the regulations, and will provide you with written confirmation that the design, construction, and installation, will meet the legal requirements.

If your farm is within a Nitrate Vulnerable Zone (NVZ) then there are rules you must follow concerning slurry storage capacity. We advise you to look at the relevant Defra guidance.

We also have a duty to protect groundwater, and ask that you avoid locating your system within a groundwater Source Protection Zone 1 or within 50 metres of a borehole, well, or spring used to supply drinking water. If you feel this is impracticable then please use our customer service line and ask to speak to someone in your local groundwater team to discuss your proposal at an early stage, as we may require additional protection measures.

Please note that there is now a requirement to notify us at the proposal stage, before you commence any construction.

When are earth bank stores suitable?

Where the soils are suitable (impermeable and stable), they are appropriate for storing slurry or semi-solid manure, or as a series of tanks or lagoons to settle and store dirty water.

To be suitable they must have a permeability of 0.000001 mm per second or less, following compaction if necessary. Impermeable soil must be present to a depth of at least one metre below the bottom of the store.

Soils with a clay content of between 20-30 per cent are generally ideal and produce stable embankments. Lower clay content may not meet the required permeability, whilst a higher one should be suitable for the base, but may be difficult to form into a stable embankment and could tend to shrink and crack on drying. The suitability of the material should be confirmed by analysis in a soils laboratory, and preferably verified by a civil engineer. Material that is intended for use in-situ without any re-compaction need only be tested for permeability and depth.

Soil testing

Initial soil tests should be taken from at least 5 locations to identify any variability in clay content and depth of impermeable soil. Where there is little variability in clay content, soils from only one sample location needs to be sent for detailed testing, otherwise send a range of samples. They need to be tested in an approved soils' laboratory to show whether the required level of impermeability can be achieved. This

involves the direct measurement of soil permeability as well as other soil characteristics. Testing should meet BS 1377 (methods of tests for soils for civil engineering purposes) or BS EN 1997-2:2007.

Where the in-situ soils are not fully suitable, you could import appropriate material, or use an impermeable synthetic liner. However, these options add significantly to the cost.

Site selection

It is important to avoid sites in a flood plain or with a high water table, and ground that has been previously made up or disturbed.

- Trees, scrub, roots, etc need to be removed.
- You must relocate any land drains to at least 10 metres away from the outside of the embankment, and carefully back-fill the trench with impermeable material.

How is my slurry storage affected by the regulations?

The SSAFO regulations set design and construction standards for slurry systems built or substantially enlarged or altered since 1991. The key aspects of the regulations are:

You must notify us in writing about any new, substantially enlarged or substantially reconstructed system at least 14 days before any construction begins.

- The notification must include the type of structure and where it is to be used. We are likely to request details of the proposed design and construction, and once an agreed proposal has been constructed we ask you to inform us a couple of weeks before you start using the facility.
- The structure(s) must be impermeable. Soil permeability should be confirmed by a qualified civil engineer or soil scientist.
- No part of the system can be within 10 metres of inland freshwaters or coastal waters that slurry could enter.

Note that "inland water" includes any stream, ditch or land drain, even if it flows for only part of the year.

- Where the store has a gravity-fed outlet or connection to another store, it must be fitted with two lockable valves in series, unless the receiving store is larger or at the same height as the outlet store.
- Each valve must be capable of completely shutting off the total flow of slurry from the store. The design and positioning of the valves should take into account the possibility of a single piece of debris obstructing both valves. The space between the valves must be at least one metre.
- The valves must be locked shut when not in use. They must only be used under close supervision and never left unattended while open or partly open.
- All parts of the system must comply with the regulations whenever it is used. Proper maintenance is therefore essential. For example do not allow tree growth on the embankment and repair rodent damage frequently.

Deciding on the size of the store or tank

You should size the slurry store (in conjunction with any other slurry storage on the farm) to accommodate the maximum quantity of slurry likely to be produced and directed to this system in any continuous four-month period. You should use rainfall figures that predict the quantity that will occur once in every five years over a 120 day period (known as the M5 120 day rainfall). This will usually occur during the months October to January inclusive, and it will be a higher volume than just using annual average rainfall figures.

If the store is part of a slurry/dirty water irrigation system, you should refer to our Fact sheet 4.

Earth bank stores must be designed and constructed to include a freeboard of 750mm, and must never be filled above this level.

What happens after I submit proposals to the Environment Agency?

We will assess your proposals and the site. In many cases we will visit the site, and meet with you or your agent.

We will make our assessment clear to you in writing.

What happens if pollution occurs?

The responsibility for preventing pollution falls to the person with custody or control of the installation. Normally that is you, the farmer.

If pollution occurs you may be liable, even if we have agreed to the system installed.

Great care is therefore essential in the construction, operation and maintenance of the system to ensure it continues to perform properly.

Where can I find further help?

There is further guidance on GOV.UK. Detailed guidance on design and construction of earth bank slurry stores can be found in CIRIA C759.

For concrete or steel constructions, and reception pits, you should refer to our Fact Sheet 1.

To help identify any Source Protection Zones, look in the 'what's in your backyard' section of our website.

If you are still unsure please contact your local Environment Agency office via the customer service line.