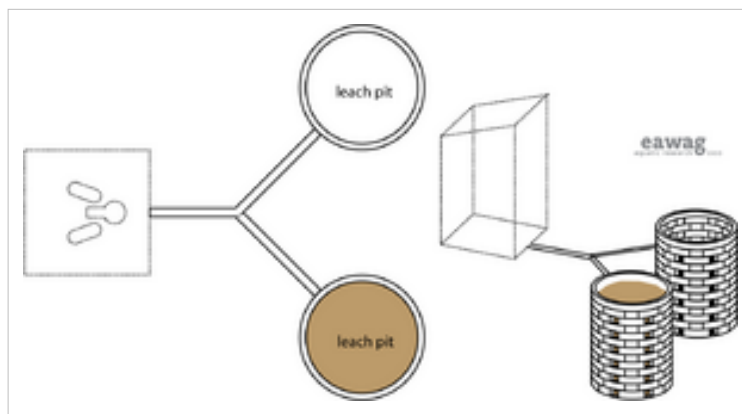


Twin_Pits_for_Pour_Flush

Application level		Management level	
Household	XX	Household	XX
Neighbourhood	X	Shared	XX
City		Public	X



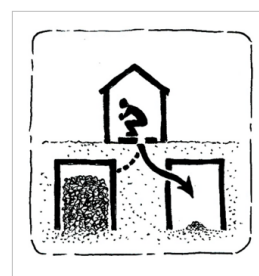
Applicable to systems:	Languages / langues / idiomas
3	  

Inputs: Blackwater , Greywater , Anal cleansing water

Outputs: Compost - EcoHumus

This technology consists of two alternating pits connected to a Pour Flush Toilet. The blackwater (and greywater) is collected in the pits and allowed to slowly infiltrate into the surrounding soil. With time, the solids are sufficiently dewatered and can be manually removed with a shovel.

The superstructure, toilet and pits, for the Twin Pits with Pour Flush technology can be designed in various ways: the toilet can be located directly over the pits or at a distance from the pits. The superstructure can be permanently constructed over both pits or it can move from side to side depending on which pit is in use. No matter how the system is designed, only one pit is used at a time. In this way, a continuous cycle of alternating pits means that they can be used indefinitely.



While one pit is filling with excreta, cleansing water and flushing water, the other full pit is resting. The pits should be an adequate size to accommodate a volume of waste generated over one or two years. This allows the contents of the full pit enough time to transform into a safe, inoffensive, soil-like material that can be excavated manually.

The difference between this technology and the Double VIP or Fossa Alterna is that it allows for the addition of water and does not include the addition of soil or organic material. As this is a water-based (wet) technology, the full pits require a longer retention time to degrade the material before it can be excavated safely. A retention time of 2 years is recommended. The degraded material is too solid to be removed with a vacuum truck.

As the effluent leaches from the pit and migrates through an unsaturated soil matrix, faecal organisms are removed. The degree of faecal organism removal varies with soil type, distance traveled, moisture and other environmental factors. There is a risk of groundwater pollution whenever there is a high or variable water table, fissures and/or cracks in the bedrock. Viruses and bacteria can travel hundreds of metres in saturated conditions. As soil and groundwater properties are often unknown, it is difficult to estimate the necessary distance between a pit and a water source. A minimum distance of 30m should be maintained between the pit and a water source to limit exposure to chemical and biological contamination.

It is recommended that the Twin Pits be constructed 1m apart from each other to minimize cross-contamination between the maturing pit and the one in use. It is also recommended that the pits be constructed over 1m from any structural foundation as leachate can negatively impact structural supports.

Water within the pit can impact the structural stability of the pit. Therefore, all walls should be lined up to the full depth of the pit to prevent collapse and the top 30cm should be fully mortared to prevent direct infiltration and ensure that the superstructure is supported.

Advantages	Disadvantages/limitations
<ul style="list-style-type: none"> - Can be built and repaired with locally available materials. - Because double pits are used alternately, their life is virtually unlimited. - Excavation of humus is easier than faecal sludge - Potential for use of stored faecal material as soil conditioner. - Flies and odours are significantly reduced (compared to non-ventilated pits). - Suitable for all types of user (sitters, squatters, washers and wipers). - Low (but variable) capital costs depending on materials; no or low operating costs if self-emptied. - Moderate reduction in pathogens. <p>requires much less water to be used for flushing as compared to conventional toilets.</p> <p>The latrine doesn't need to be moved when the pit is full.</p>	<ul style="list-style-type: none"> - Excreta requires manual removal. - Clogging is frequent when bulky cleansing materials are used

Adequacy

The Twin Pits with Pour Flush is a permanent technology that is appropriate for areas where it is not appropriate to continuously move a pit latrine. It is a water-based technology and is only appropriate where there is a constant supply of water for flushing (e.g. recycled greywater or rainwater). Greywater can be co-managed along with the blackwater in the twin pits.

This technology is not appropriate for areas with a high groundwater table or areas that are frequently flooded. In order for the pits to drain properly, the soil must have a good absorptive capacity; clay, tightly packed or rocky soils are not appropriate.

As long as water is available, the Twin Pits with Pour Flush technology is appropriate for almost every type of housing density. However, too many wet pits in a small area is not recommended as there may not be sufficient capacity to absorb the liquid into the soil matrix from all of the pits and the ground may become water-logged (oversaturated).

The material is manually emptied from the Twin Pits (it is dug out, not pumped out), so vacuum truck access to the pits is not necessary.

The Twin Pits with Pour Flush technology will only work properly if the two pits are used sequentially and not concurrently. Therefore, an adequate cover for the out of service pit is required.

Health Aspects/Acceptance

The waterseal provides a high level of comfort and cleanliness, with few odours. It is a commonly accepted sanitation option, however some health concerns exist:

- Latrine leachate can contaminate groundwater;
- Stagnant water in pits may promote insect breeding;
- Pits are susceptible to failure/overflowing during floods.

Maintenance

The pits must be emptied regularly and care must be taken to ensure that they do not flood during rainy seasons. After a recommended two year resting time, the pits should be emptied manually using long handled shovels and proper personal protection. If the pits are self-emptied there are no operational costs except for any replacements to the structure or slab in the event of damage.

Sulabh toilets

The Indian NGO Sulabh International designed a system using pour flush toilets and twin pits for treatment of sanitation products. They have constructed over a million toilets in India. They further designed a system which converts the effluent into biogas. These technologies are now used by 10 million people in rural India. This contributed greatly to the increase in number of people using a toilet, from 27% to 59% in the last 5 years. They have also built public toilets in Afghanistan, Bhutan, Ghana, Ethiopia, Madagascar, Mozambique, Laos, and Cambodia. They are planning to start up Sulabh Sanitation centres in 50 more countries soon.

Acknowledgements

The material on this page was adapted from: Tilley, E. et al. (2008). Compendium of Sanitation Systems and Technologies ^[2], published by Sandec ^[3], the Department of Water and Sanitation in Developing Countries of Eawag ^[4], the Swiss Federal Institute of Aquatic Science and Technology, Dübendorf, Switzerland. The publication is available in English, French, and will be made available in Spanish. Available in the IRC Digital Library ^[5]



References

- [1] http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/compendium_e/index_EN
- [2] http://www.eawag.ch/organisation/abteilungen/sandec/publikationen/publications_sesp/downloads_sesp/compendium_high.pdf
- [3] http://www.eawag.ch/organisation/abteilungen/sandec/index_EN
- [4] http://www.eawag.ch/index_EN
- [5] <http://www.irc.nl/docsearch/title/163208>

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