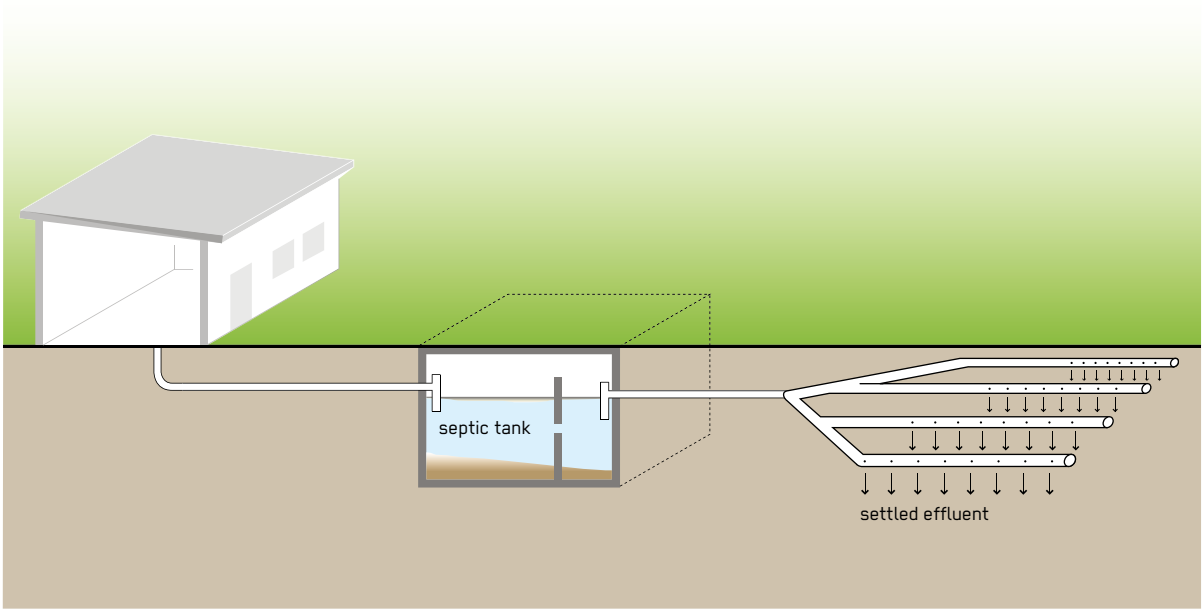
Leach Field

Phase of Emergency	Application Level / Scale	Management Level	Objectives / Key Features
Acute Response * Stabilisation ** Recovery	** Household * Neighbourhood City	** Household ** Shared * Public	Use of treatment capacity of the soil, Safe disposal of effluent
Space Required	**Technical Complexity**	**Inputs**	**Outputs**
** Medium	** Medium	● Effluent	



A Leach Field, or drainage field, is a network of perforated pipes that are laid in underground gravel-filled trenches to dissipate the effluent from a water-based collection and storage/treatment or a (semi-) centralised treatment technology on a wider surface area.

Pre-settled effluent is fed into a piping system (distribution box and several parallel channels) that distributes the flow into the subsurface soil for absorption and subsequent treatment. A dosing or pressurised distribution system may be installed to ensure that the whole length of the Leach Field is utilised and that aerobic conditions are re-established between dosings. Such a dosing system releases the pressurised effluent into the Leach Field with a timer (usually 3 to 4 times a day).

Design Considerations: Each trench is 0.3 to 1.5 m deep and 0.3 to 1 m wide. The bottom of each trench is filled with about 15 cm of clean rock and a perforated distribution pipe is laid on top. More rock is placed to cover the pipe. A layer of geotextile fabric is placed on the rock layer to prevent small particles from plugging the pipe. A final layer of sand and/or topsoil covers the fabric and fills the trench to the ground level. The pipe should be placed at least 15 cm beneath the surface to prevent effluent from surfacing. The trenches should be dug no longer than 20 m in length and at least 1 to 2 m apart. To prevent contamination, a Leach Field should be located at least 30 m away from any drinking water source and be built at least 1.5 m above the groundwater table. A Leach Field should be laid out such that it will not interfere with a future sewer connection.

Materials: Leach Fields require piping and rocks and a geotextile fabric to cover the piping in the trenches. These are materials that are usually locally available.

Applicability: Leach Fields can be a quick and easy to build means of disposing of large quantities of wastewater during an emergency, if there is enough land available with good infiltration capacity and unsaturated soil. Due to potential oversaturation of the soil, Leach Fields are not appropriate for dense urban areas, areas prone to flooding, or areas with high groundwater tables. Leach Fields can be used in almost every climate, although there may be problems with pooling effluent in areas where the ground freezes. Homeowners with a Leach Field must be aware of how it works and of their maintenance responsibilities. Trees and deep-rooted plants should be kept away from the Leach Field as roots can crack and disturb the pipes and layer beneath.

Operation and Maintenance: A Leach Field will become clogged over time, although this may take more than 20 years, if a well-maintained and well-functioning primary treatment technology is in place. Effectively, a Leach Field should require minimal maintenance; however, if the system stops working efficiently, the pipes should be cleaned and/or removed and replaced. There should also be no heavy traffic above it as this could crush the pipes or compact the soil.

Health and Safety: Since the technology is underground and requires little attention, users will rarely come into contact with the effluent, and there is no immediate health risk. Groundwater contamination can be an issue and the Leach Field must be kept far away from any potential potable water source. Soil properties such as the permeability of the soil and groundwater level should be properly assessed **(X.3)** to limit exposure of water sources to microbial contamination. The Sphere minimum standards on excreta management should be consulted for further guidance.

Costs: If all required materials are locally available, the material costs can be kept low. However, this technology requires a lot of land, which can be expensive particularly in urban areas.

Social Considerations: Large quantities of wastewater percolating into the soil can become a concern to the local community. Therefore, the safety and effectiveness of this technology needs to be well communicated to the community.

Strengths and Weaknesses:

⊕ Can be used for the combined treatment and disposal of effluent
⊕ Has a long lifespan (depending on conditions)
⊕ Low maintenance requirement if operated without mechanical equipment
⊕ Relatively low capital and operating costs

⊖ Requires expert design and construction
⊖ Requires a large land area
⊖ Primary treatment is required to prevent clogging
⊖ May negatively affect soil and groundwater properties

→ **References and further reading material for this technology can be found on page 195**