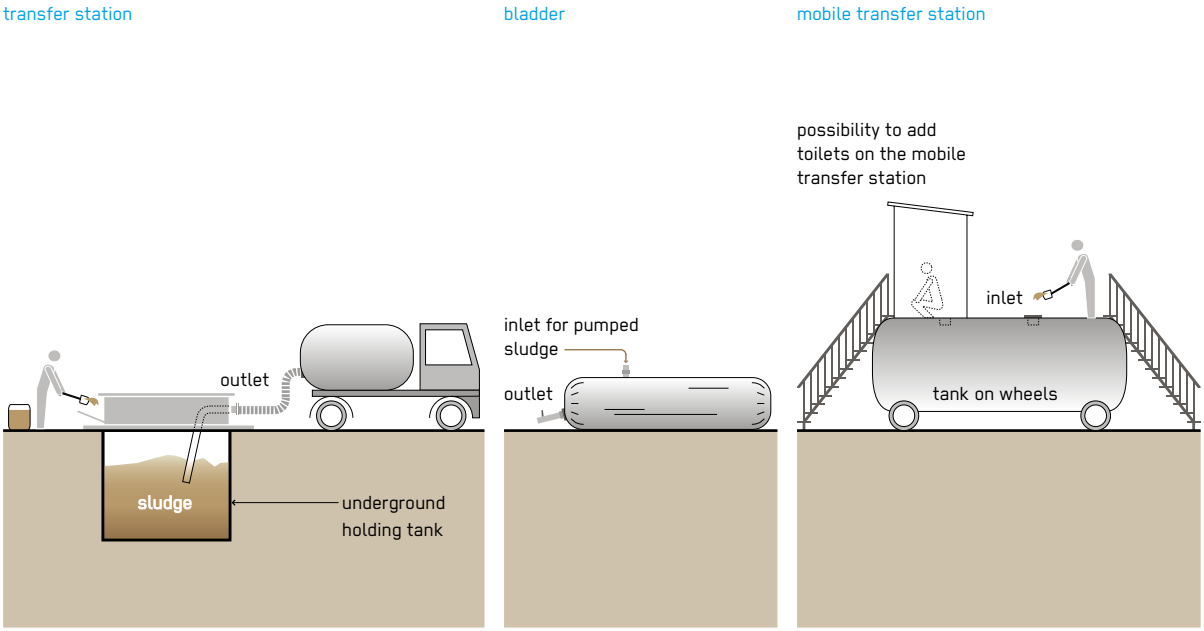
Transfer Station and Storage

Phase of Emergency	Application Level / Scale	Management Level	Objectives / Key Features
* Acute Response * Stabilisation ** Recovery	Household ** Neighbourhood ** City	Household * Shared ** Public	Interface between manual and motorised emptying
Space Required	**Technical Complexity**	**Inputs / Outputs**	
** Medium	** Medium	● Sludge	



Intermediate semi-centralised storage facilities such as Transfer Stations, bladders or sewer discharge stations are required when faecal sludge cannot be easily transported immediately to a final treatment facility. Motorised Emptying and Transport (C.2), for example by a vacuum truck, is required to empty transfer stations when they are full.

Operators of manual or small-scale motorised sludge emptying equipment should discharge sludge at intermediate storage facilities rather than illegally dumping it or travelling to discharge it at a remote treatment or disposal site. When the storage facility is full, Motorised Emptying and Transport **(C.2)** can remove the contents and take the sludge to a suitable treatment facility. Municipalities or sewerage authorities may charge for permits to dump at the facilities to offset the operation and maintenance costs of the facility. In urban settings, facilities must be carefully located, as odours can become a nuisance, especially if facilities are not well maintained.

Design Considerations: Different types of intermediate storage facilities exist, such as Transfer Stations, sewer discharge stations (SDS) or bladders with different designs and purposes. There are two types of Transfer Stations: fixed and mobile. A fixed Transfer Station, also called an underground holding tank, consists of a parking place for vacuum trucks or sludge carts, a connection point for discharge hoses, and a fixed storage tank. The dumping point should be built low enough to minimise spills when labourers manually empty their sludge carts. The Transfer Station should include a vent, a trash screen **(PRE)** to remove large debris (solid waste) and a washing facility for disinfecting vessels and vehicles. The holding tank must be well constructed to prevent leaching and/or surface water infiltration. A mobile Transfer Station consists of transportable containers for intermediate storage, basically a tank on wheels. To further minimise transport needs, toilets can be constructed directly above the tank. A variation is the SDS, which is directly connected to a Conventional Gravity Sewer **(C.4)** main. Sludge emptied

into the SDS is released into the sewer main either directly or at timed intervals (e.g. by pumping) to optimise performance of sewer and wastewater treatment plant, and/or reduce peak loads. Transfer Stations can be equipped with digital data recording devices to track quantity, input type and origin, as well as collect data about individuals who dump there. In this way, the operator can collect detailed information and more accurately plan and adapt to differing loads. Bladders are robust bags that can be filled with any form of liquid, including faecal sludge. Bladders can be placed in any flat terrain. They can be placed on a truck before they fill up and transported after filling. A bladder is very small when empty and therefore easily deployable during an emergency.

Materials: Intermediate storage facilities must be sealed. They can be constructed with sealed bricks or cement. For mobile Transfers Stations a container or tank is needed, ideally already mounted on a vehicle. Bladders are prefabricated flexible containers and usually made out of butyl rubber fabric or fabric reinforced plastic.

Applicability: Transfer Stations are appropriate for dense, urban areas where there are no alternative discharge points for faecal sludge, as well as for camp settings that are situated away from a suitable treatment facility. Establishing multiple Transfer Stations may help to reduce the incidence of illegal sludge dumping and promote the market for appropriate sludge disposal. They are especially appropriate where small-scale sludge emptying takes place. Local service providers can discharge sludge at Transfer Stations during the day, while large trucks can empty tanks and go to the treatment plant at night when traffic is light. Transfer Stations should be located where they are easily accessible, convenient, and easy to use. Depending on their maintenance, odours can become a problem to local residents. However, the communal benefits gained from them compared to open-air illegal dumping greatly offset any local nuisances. During the acute emergency phase, until there is a more appropriate solution it is possible to use bladders or other small storage units.

Operation and Maintenance: Screens at the inlet must be frequently cleaned to ensure a constant flow and prevent back-ups. Sand, grit and consolidated sludge must also be periodically removed from the holding tank. There should be a well-organised system to empty the holding tank. The loading area should be regularly cleaned to minimise odours, flies and other vectors from becoming nuisances.

Costs: In big cities, Transfer Stations can reduce costs incurred by truck operators by decreasing transport distances and waiting times in traffic jams. Capital costs for implementing this technology are low to moderate, however, operational costs and respective cost-recovery mechanisms, such as fees, need to be considered. The system for issuing permits or charging access fees must be carefully designed so that those who most need the service are not excluded due to high costs, while still generating enough income to sustainably operate and maintain the Transfer Stations.

Social Considerations: Transfer Stations provide an inexpensive, local solution for intermediate faecal sludge storage. By providing a Transfer Station, independent or small-scale service providers are no longer forced to illegally dump sludge, and homeowners are more motivated to empty their pits or tanks. When pits are regularly emptied and illegal dumping is minimised, the overall health of a community can be significantly improved. The location must be carefully chosen to maximise efficiency and minimise odours and problems to nearby residents.

Strengths and Weaknesses:

⊕ Makes sludge transport to treatment plant more efficient
⊕ May reduce illegal dumping of faecal sludge
⊕ Potential for local job creation and income generation

⊖ Requires expert design and construction
⊖ Can lead to odours if not properly maintained

→ **References and further reading material for this technology can be found on page 193**