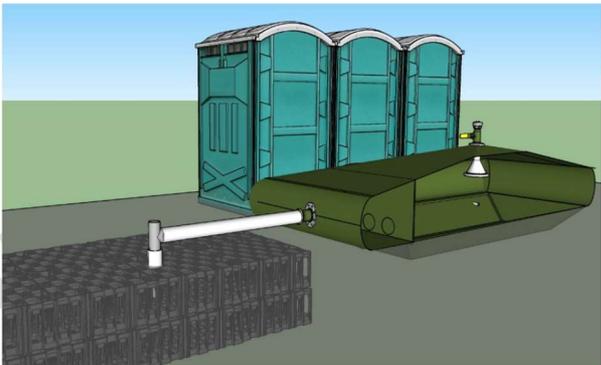


## Septic tank kit

In rapid onset emergencies, in situations where it is impossible to dig trench latrines due to rocky or water logged ground or lack of permission, containment of waste is frequently the only option. Ongoing desludging costs of shallow pit or raised latrines is high. Septic tanks allow solids to settle as sludge and liquid effluent to discharge safely to a soakaway. Frequency and volume of desludging is therefore much lower than with full containment. Septic tanks are typically constructed with masonry or concrete so seen as a medium to long term solution. The flatpack, septic tank bladder kit developed under ESP can be set up in a matter of hours enabling septic tanks to be used in the first phase of an emergency.

<b>Treatment technology:</b>	Partial treatment through settlement and anaerobic digestion. Liquid discharge safely to soakaway.	
<b>Treatment objective</b>	Containment, reduction in volume of fecal sludge, improvement in quality of liquid effluent.	
<b>Treatment capacity</b>	Designed for up to 500 people (10 toilets x 50 people). Bladder will provide sufficient storage for 6 months before desludging is required.	
<b>Site requirements</b>	Surface area of 20m <sup>2</sup> (septic tank and soakaway) surrounded by 6-10 toilets. Land needs to be levelled and free from sharp objectives that could damage the bladder membrane. Infiltration capacity of surrounding soil suitable to absorb pre-treated waste water (soakaway) or method of safely channelling and disposing of liquid.	
<b>Life expectancy</b>	Targeted for use in the first 6 months of a response, but materials are sufficiently robust to last for several years, it required. Septic tank can be re-used subject to cleaning and disinfection.	
<b>Weight and volume</b>	7.4m (L), 2.4m (W), 1.0m (H) Packaged volume and weight tbc	
<b>Start up time</b>	1 day set up, considering ground preparation and installation of soakaway	
<b>Capital cost</b>	€3,500.	
<b>Operational cost</b>	Periodic desludging. Based on 500 users per day, initial desludging required after 6 months.	
<b>Equipment overview</b>	The proposed system consist of the main system components as follows:	
	<b>Component</b>	<b>Function</b>
	1. Flexible connection to the toilet blocks	Connection with standard fast coupler to connect the toilet siphon at flexible height to the septic bag
	2. Two chamber membrane bag with revision openings	Core treatment component where the incoming feces gets decomposed, liquid and solid fraction separated and sludge particle accumulated until emptying in period of 6 – 12 month
	3. Desludging connector	To enable to desludge with means of a vacuum system the accumulated sludge without destroying or damaging the membrane
	4. Overflow outlet pipe	Outlet for the separated liquid phase with integrated particle filter
	5. Particle filter	Avoids that sludge particles or scum enters and blocks the infiltration system and to allow an easy cleaning

	<p>6. Underground soak-a-way</p>	<p>Infiltrates and disposes the effluent of the septic bag continually into the ground</p>
	<p>7. Vent pipe or optionally biogas outlet</p>	<p>Digestion or biogas will be produced and can either released to the atmosphere or captured compressed to proposed pressure of 10 to 20 cm water column. Several bag can be connected to one biogas pipe network.</p>
<p><b>Process overview</b></p>	<p>A septic tank takes raw water in, allows the solids to settle as sludge and the remaining liquid to flow into the surrounding soil by means of a soakaway. Septic tanks are suitable for conditions where the wastewater can drain away and be absorbed into the soil without contaminating ground or surface waters. Where infiltration capacity of the surrounding soil</p> <div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;">   </div>	
<p><b>Additional considerations</b></p>	<ul style="list-style-type: none"> <li>- Absorption capacity of soil, soakaways are not suitable in clay soils with minimal infiltration capacity</li> <li>- Properly designed soakaway with adequate surface area, taking account of effluent discharge rate and infiltration capacity of soil (confirmed through infiltration test).</li> <li>- Access and availability of desludging equipment.</li> </ul>	
<p><b>Advantages over other toilet options</b></p>	<ul style="list-style-type: none"> <li>- Suitable in challenging ground conditions (rocky or loose soils) and flood prone areas, where it is difficult and expensive to dig latrines.</li> <li>- Where there are restrictions digging pit latrines and disposing of fecal sludge underground.</li> <li>- Where containment of waste is required.</li> <li>- Separation of solids and safe disposal of liquid effluent via soakaway reduces the need and frequency of desludging thereby reducing ongoing operational costs.</li> </ul>	