

# HUBER SeptageTreat<sup>®</sup> Solution Septic Sludge Treatment for Reuse



- Decentralized treatment of septic sludge
- Reuse of bio-solids for soil improvement
- Reuse of nutrients as fertilizer
- Reuse of water for irrigation or as process water
- Recovery of energy

## ►► Protecting our environment and closing loops by septic sludge treatment and reuse

Septic tanks are used worldwide for decentralized mechanical wastewater treatment. Accumulated septic sludge must be removed in regular intervals. What, then, is to be done with the collected septic sludge?

Where possible, collected septic sludge is treated at large centralized wastewater treatment plants. Since such plants are usually not available in developing and emerging countries, collected septic sludge is often hauled to far away wastelands or landfills. Long distance hauling costs tanker truck capacity, driver time and fuel.

Methane is released during uncontrolled anaerobic degradation. Methane is 23 times stronger than carbon dioxide as a greenhouse gas. In addition, extremely odorous and toxic hydrogen sulphide is emitted, causing acid rain.

Septic sludge must be treated to prevent serious environmental damage. Though it is offensive, odorous and corrosive, it contains water, nutrients, organic carbon and energy that should be reused as valuable resources.

## ►► HUBER SeptageTreat® Solution

### Pre-Treatment

Septic sludge is hauled to a centralized treatment plant. Every sludge hauler inserts his plastic identification card into a card reader to open an automatic valve. The discharged sludge volume is measured, recorded and billed.

A pH-meter and an automatic sampler are provided to prevent haulers from discharging toxic waste. The samples are kept for a limited time and are only analyzed for identification and as proof if there is an indication that illegal discharge has happened.

The delivered septic sludge is pre-treated by screening and grit removal. The removed screenings are washed, dewatered, compacted and bagged in an integrated washpress. The washed and compacted screenings are incinerated or disposed of as domestic solid waste on a landfill. Washed grit is reused as construction material, e.g. for road or pipe bedding.

To prevent odour nuisance and corrosion, our pre-treatment units are entirely enclosed and made of stainless steel.



*ROTAMAT® Ro 3.3 septic sludge pre-treatment unit in Kuching, Malaysia*



*A pair of parallel ROTAMAT® Ro 3.3 units in Dong Guan, China*

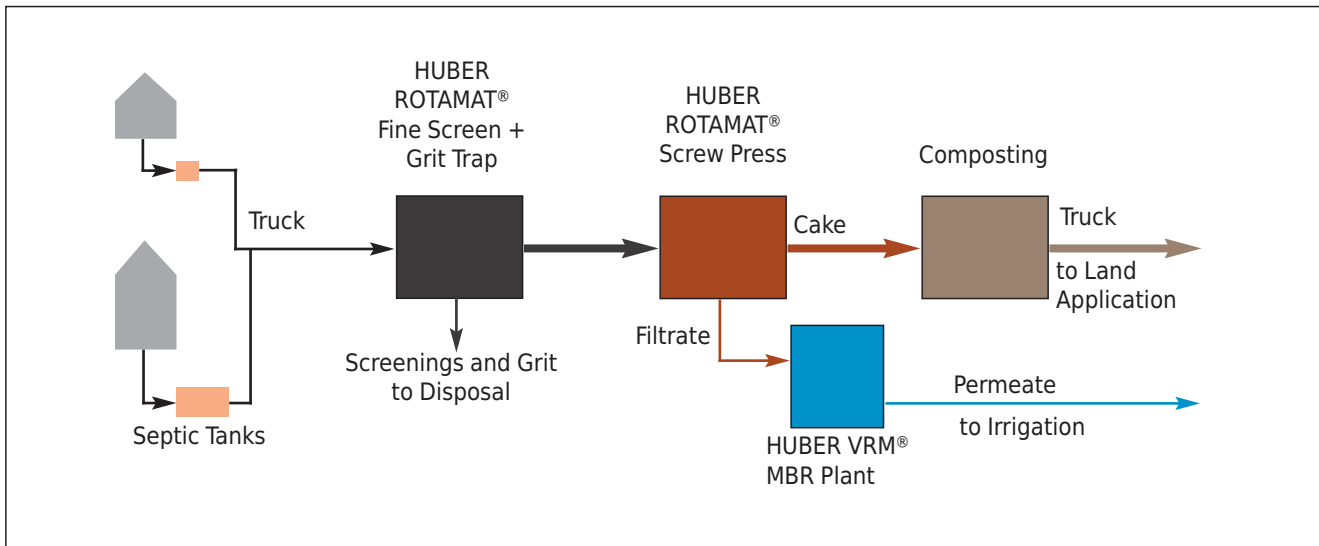
**Alternative 1: Composting**

The first alternative is dewatering of pre-treated sludge to form sludge cake that is biologically stabilized by aerobic composting.

Composting is usually done by piling sludge cake up to form simple windrows that are frequently turned over in order to keep the sludge porous and thus under aerobic conditions.

To achieve thorough biological stabilization, composting in windrows takes several months. Where the climate is warm and dry, the sludge is simultaneously dried to some extent.

Composting is labour-intensive, but investment is low. Odour and carbon dioxide emissions are unavoidable.



*HUBER SeptagTreat® Solution with aerobic composting*

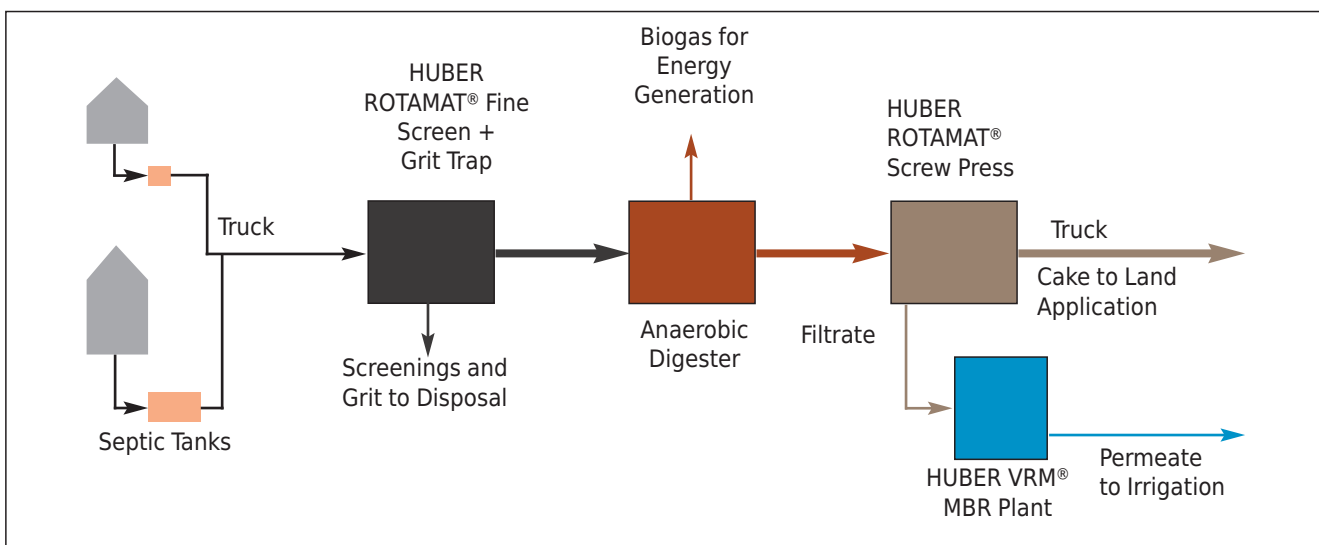
**Alternative 2: Anaerobic Digestion**

The other alternative is biological stabilization of the pre-treated liquid sludge by anaerobic digestion, followed by dewatering of the digested sludge.

Anaerobic digesters are entirely enclosed, heated and well-mixed reactors. Odour emission cannot occur. Biogas is generated by anaerobic degradation of organic components.

Biogas has energy value and is used for power and heat co-generation. Some heat is used for heating of the digesters. The remaining heat is used otherwise, e.g. for further drying of the dewatered sludge product.

Digested sludge is stabilized and no longer odorous after a detention time of 2 to 3 weeks.



*Alternative 2: HUBER SeptagTreat® Solution with anaerobic digestion*

### Sludge Dewatering

Both alternatives include sludge dewatering for reduction of its mass and volume to less than 10 %.

Our ROTAMAT® Screw Presses are entirely enclosed to prevent emission of odour or vapour; they are made of stainless steel to prevent corrosion. They have low power and wash water consumptions, are fully automated, and dewater septic sludge to a cake with about 25 % dry solids. The cake has a crumbly consistence, which is very important for subsequent composting or sludge drying.

The produced bio-solids contain nutrients and about 50 % of the organic carbon. They are used for fertilizing and soil improvement. Bio-solids generate valuable humus, which is most important for mitigation of soil erosion.

### Filtrate Treatment

Filtrate from sludge dewatering is biologically treated in a compact HUBER membrane bio-reactor (MBR), combining an activated sludge process with ultra-filtration.

The permeate effluent is free of solids and germs, but contains nutrients. It is disinfected and has bathing water quality. It is reused as process water, e.g. for washing and flushing, or for irrigation.

## ►► SeptageTreat® References

About thirty HUBER SeptageTreat® systems are in successful operation today, most of them in East and South-East Asia.



*Inauguration of a SeptageTreat® Plant in Manila by President Gloria Arroyo*



*ROTAMAT® RoS 3 screw presses in Kuching, Malaysia*



*Slowly rotating HUBER VRM® ultra-filtration membrane in a membrane bio-reactor*



*The first tanker truck load is discharged into the new plant*

## HUBER SE

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