Danish Rootzone
Transform
Transform ApS af 1994

ENGINEERING BIO SUSTAINABLE SOLUTIONS

ETA DANMARK

SLUDGE MANAGEMENT

Nature-based technology for sustainable development

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
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11 SUSTAINABLE CITIES AND COMMUNITIES
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Bio engineers: Design Supervision Construction Operation

About us

Technically, Transform af 1994 ApS is one of the most experienced environmental engineering companies regarding municipal and industrial waste, wastewater and sludge treatment technology. With more than 30 years' of experience in the field of waste management, Transform has developed and implemented over 1000 waste, wasterwater and sludge management projects worldwide.

Waste to Value - Sludge Management

Transform af 1994 ApS ´s technology for sludge treatment is nature-based and has the following environment, economic and social benefits:

. Low cost, highly effficient and sustainable
. Self regulating ecosystems
. Easy to maintain
. Meets the Government demand
. Reduces sludge with 95% by mineralization
. Consumes low energy and no chemicals
. Has a positive carbon credit without emission of carbondioxide
. Greens and cools the environment
. Treated sludge can be mixed with organic waste to produce bio fertilizers
. Environmentally safe and friendly

Transform af 1994 ApS, examines every case on an individual basis to ensure that the best solution is implemented . We take a holistic approach, looking at the source of the pollution and ways to reduce the problem as well as cost effective re -use of the output.

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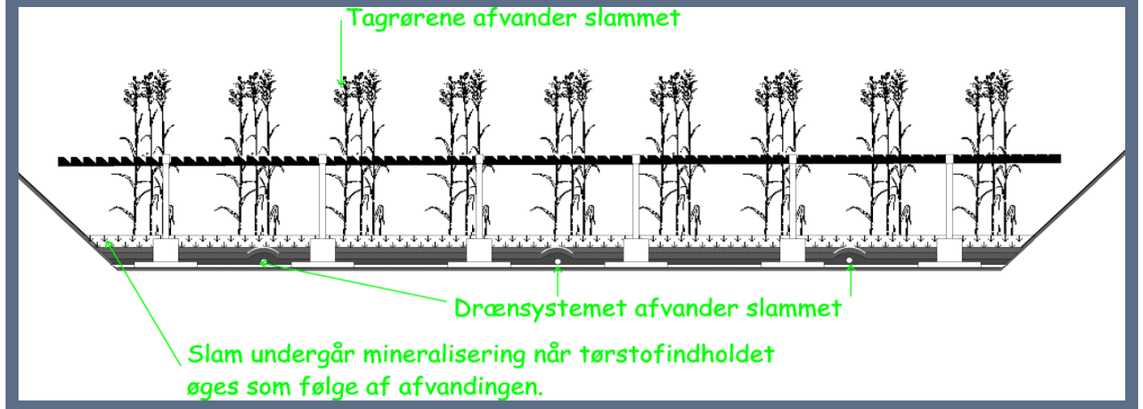
Mineralisation of Sludge

A cost efficient, environmentally safe and energy wise system for sludge treatment with Remediation

Mineralisation plants for reduction of sludge volumes were principally developed in Germany in the 80s. In Denmark, the method has been introduced to the oil sector with a number of plants.
Further, a line of municipalities has constructed plants due to the low costs of implementation and maintenance.

In the sludge mineralisation beds or root-zone, the dry matter is dewatered and mineralised so that the sludge amount is re-duced to 2-4% of the original amount.
The residue is removed with intervals of 10-20 years for composting or deposit. Sludge mineralisation beds utilise the evaporative and aerating capabilities of the wetland species reed, Phragmites Australis.
The project layout depends on the dry mat-ter content of the applied sludge.

Upon a membrane of clay/bentonite or plastic, 50 cm mineralisation zone / filter is placed and planted with reeds.
In the bottom of the plant, a drainage system is put into place. Excess liquid is returned to the waste water treatment plant, which may be a root zone filter or another type of wastewater treatment plant.



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The procedure for spreading the sludge in the mineralisation bed depends on the type of sludge, as do the application rates.

It is important that the applications are adjusted to the biological activity of the plant in order to obtain maximum dewatering and mineralisation, that is, maximum volume reduction.

Every third season, the bed should rest to complete the mineralisation. Therefore at least three beds should be constructed per plant. The size and aspect ratio follows management concerns and general load requirements.

When mineralising organic matter in the sludge, 60-70 per cent of the dry matter is transferred into CO2, oxygen, free nitrogen and partly dewatered soil particles. Part of the released carbon dioxide is re-assimilated into plants and microbes through photosynthesis.

The sludge is dewatered, depending on the local climate, to a dry matter content of 35% to 60% within two to three weeks.
In the long term the sludge will be reduced to 2-4% of the originally applied volume.
This will also be the reduction in all management costs (handling, transport, final deposition etc.)
Experience reveals that sludge mineralisation plants will metabolise 6-8 m3/m2/year at a high dry matter level and 20-40 m3/m2/year at a low dry matter level.

References:

Mineralisation plants for municipal waste water
treatment plants: Karlebo, Fredensborg,
Slangerup, Glumsø, Gelsted,
Ejby, Brenderup, Harndrup, Tørring,
Åle (Denmark), Inwald (Polen)

Transport and oil sector mineralisation plants with water recirculation: Danish State Railways Fredericia train cleaning facility, Copenhagen Free Port Container Cleaning, Carlsberg truckcentre,
Shell, Metax, Statoil, Minol, Q8, Norsk Hydro, Texaco, DK-Benzin car wash facilities.

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