Press release

BIBKO® INFRA*TEC* - Recycling of sewer flushing material and other wastes
- the selection of the ideal recycling system

For hygienic reasons, effluent disposal is one of the most important tasks in building services engineering. The sewage systems have the task of removing wastewater and rainwater from buildings and properties. Effluent includes sewage water, rainwater and the so-called mixed water.

Sewage water is water that consists of all wastewater from bathrooms, toilets, kitchens and other rooms in the house. Over the last thirty years, this has been declining and is now around 130 l per inhabitant per day. This is primarily due to the fact that the use of new technologies (economy buttons on the toilet or shower heads with an economy function) and more conscious use of the precious resource water are steadily reducing total consumption.

Rainwater is defined as rainwater that is discharged through roofs and other building surfaces. The quality and contamination of rainwater varies greatly.

If the two types of water, *sewage water* and *rainwater*, are routed or combined in a sewer system, this is referred to as *mixed water*.

Deposits in the sewer system
Deposits in a sewer system occur especially in times of low wastewater volumes and thus low flow velocities, as well as when there are high concentrations of material. For this reason, preventive and on-demand cleaning of the sewer system is becoming increasingly important in order to prevent flooding caused by blocked sewers.

Composition
Sewer systems are cleaned with suction/ flushing vehicles. The collected sewer flushing material consists of:

Coarse material >2 mm	approx. 5%
Organic matter	approx. 5%
Sand <2 mm	approx. 30%
Water	approx. 60%

Disposal or recycling
After the sewer flushing material has been collected, it is often handed over to an external disposal company for treatment and professional disposal. Appropriate disposal costs are charged for this. Higher Z classification values also mean higher disposal costs. An alternative to the disposal of the sewer flushing material via an external disposal company is the recycling with an own recycling plant.

Suction/flushing vehicle during emptying

Recycling systems and degree of recycling
Various recycling systems are presented below as examples. They differ in their objectives and degree of recycling. In the diagrams shown, the recyclable materials are marked in green, the non-recyclable materials in grey.

For a better overview, the recycling systems are also evaluated according to the following criteria.

- Low investment costs
- Reduction of the disposal volume
- Reduction of the allocation value Z
- Generation of secondary raw materials
- Recycling of process water

The following classification indication is used:

applicable/ included

less applicable/ not included

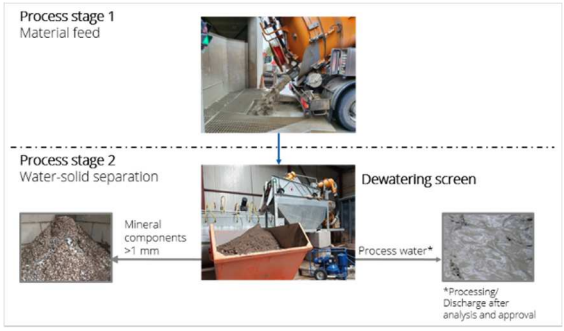
In addition, the criteria are evaluated according to their degree of expression. An evaluation with +++ stands for a strong expression, with + for a weak expression.

While recycling system I has only a low degree of recycling and correspondingly high disposal costs, recycling system II has a high degree of recycling and reduced disposal costs.

Emptying bentonite suspension

Recycling system I

This recycling system is a relatively simple solution. It consists only of material feeding and water-solid separation.



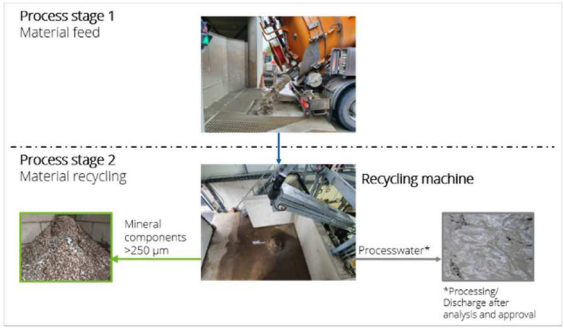
Schematc recycling system I

For recycling system I there are the following assessment results:

Criteria	Assessment
Low investment costs	+++
Reduction of the disposal volume	+++
Reduction of the allocation value	
Production of secondary raw materials	
Recycling of process water	

Recycling system II

In this recycling system, the water-solid separation from recycling system I is replaced by a recycling plant.



Schematic recycling system II

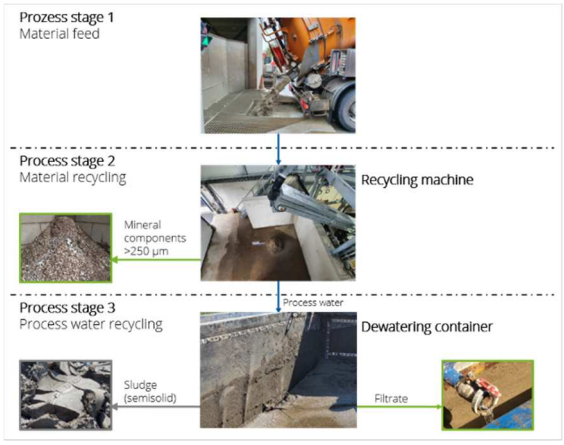
For recycling system II there are the following assessment results:

Criteria	Assessment
Low investment costs	++
Reduction of the disposal volume	+++
Reduction of the allocation value	+++
Production of secondary raw materials	+++
Recycling of process water	

Material from recycling of bentonite suspension

Recycling system III

For both recycling systems I and II, it is assumed that the resulting process water is processed or discharged after analysis and approval. If direct discharge is not possible, the process water must also be re-cycled before discharge. Recycling system III represents a solution based on recycling system II and additionally includes simple process water recycling with a dewatering container.



Schematic recycling system III

For recycling system III there are the following assessment results:

Criteria	Assessment
Low investment costs	+
Reduction of the disposal volume	+++
Reduction of the allocation value	+++
Production of secondary raw materials	+++
Recycling of process water	+

Recycling system IV

In recycling system IV, the relatively simple process water recycling is replaced by a technically more complex process water recycling with filter press (process stage 4) compared to recycling system III.
In addition, this recycling system includes a fine particle separation (process stage 3). This removes further mineral components from the process water.

Schema Recyclingsystem IV

For recycling system IV there are the following assessment results:

Criteria	Assessment
Low investment costs	
Reduction of the disposal volume	+++
Reduction of the allocation value	+++
Production of secondary raw materials	+++
Recycling of process water	+++

Summary

In order to select the ideal recycling system, the following questions must first be answered:

What is the objective of the recycling system:

- Is a reduction of the disposal volume sufficient?

- Should the allocation value Z also be improved?

Which recycling depth should be realised:

- Is the recycling of mineral components and thus the production of secondary raw materials sufficient?
- Should an additional recycling system be provided for the resulting process water?

Filter cake from recycling of bentonite suspension

The recycling systems I - IV with schematic and evaluation matrix give a first orientation. For the final decision, however, the following points must also be taken into account:

- Disposal costs to date compared to the expected costs with recycling plant
- Ecological model and vision of the operator
- Possible location of a recycling plant
- Investment costs
- Logistics and handling of the recycled material
- Possibilities for recovery of the recycled materials
- Disposal options for non-recyclable materials