

IMPROVEMENT OF AEROBIC SLUDGE STABILIZATION BY ULTRASOUND TECHNOLOGY

Leinetal WWTP, Germany



I. Brief snapshot of the plant

Design capacity	46,000 PE
Actual loading	55,000 PE
Biological wastewater treatment	<ul style="list-style-type: none"> • P-Elimination • Intermittent denitrification • Downstream P-precipitation (Fe^{3+}) • Sludge age: 15 – 20 days
Sludge treatment	<ul style="list-style-type: none"> • No Primary sludge • Thickened waste activated sludge
Separate waste activated sludge thickening	<ul style="list-style-type: none"> • Static thickening
Degradation of volatile solids (VS)	<ul style="list-style-type: none"> • 75% of dry solids (before trial)
Digested sludge dewatering	<ul style="list-style-type: none"> • Centrifuge
Sludge disposal	<ul style="list-style-type: none"> • Agriculture

II. Objective of the ultrasound application

- Improve aerobic sludge stabilization, avoid the construction of an additional activated sludge tank
- Combat bulking sludge Improvement of dewaterability for the reduction of disposal costs

III. Preliminary trial of the ultrasound disintegration system

- Test phase of three months (December 2002 – February 2003)
- 30% of the total TWAS flow was treated with one ultrasound unit à 5 kW, 24 h/d in operation, treated TWAS was returned to the aerobic tank (Figure 1)

IV. Results

- Intensified aerobic sludge stabilization:
 - 20% reduction of sludge amount for disposal (Figure 2)
- Combat bulking sludge:
 - Destruction of the bulking sludge
 - Reduction of the sludge volume index from 140 ml/g to 85 ml/g

V. Full-scale installation

Since June 2003 the ultrasound system is implemented on Leinetal WWTP.

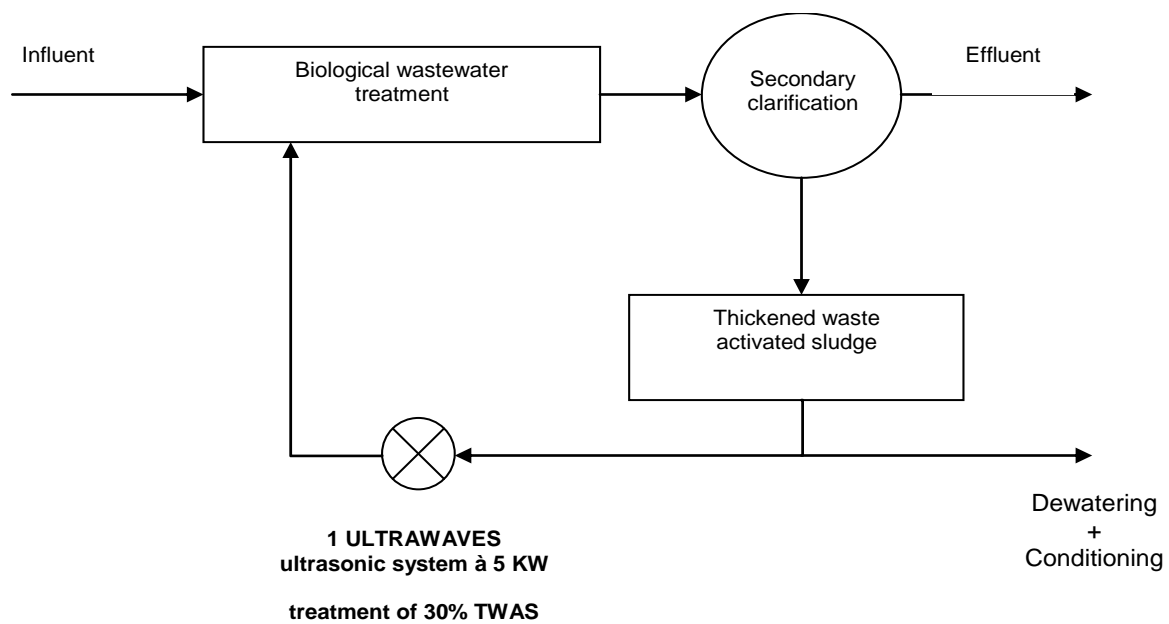


Figure 1: Scheme of sludge treatment on Leinetal WWTP

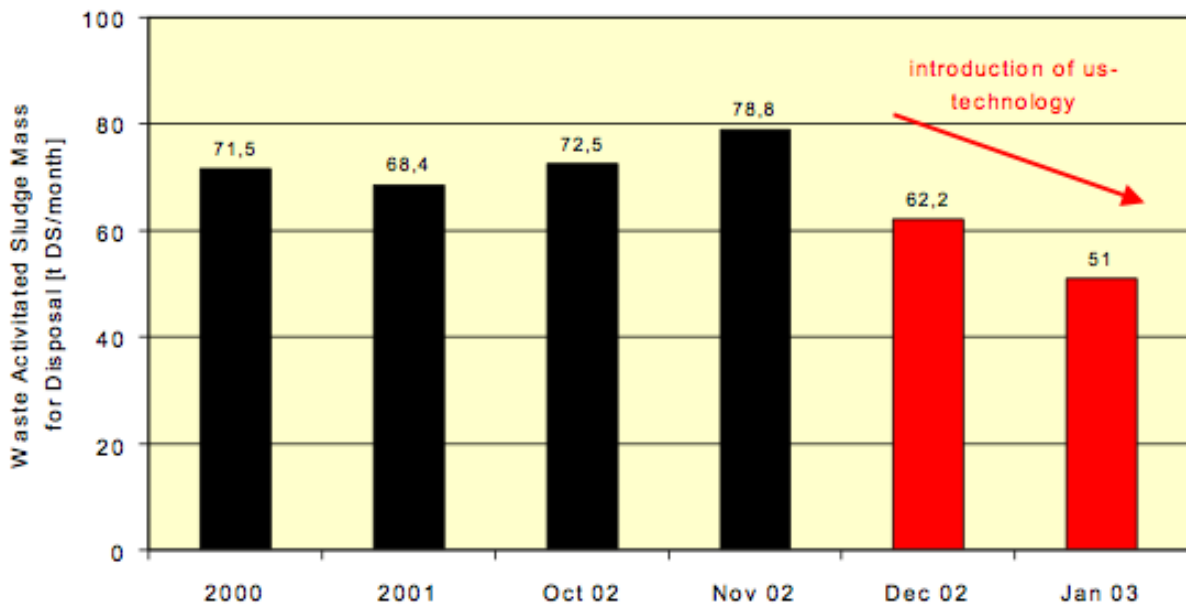


Figure 2: Waste activated sludge mass for disposal over time

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