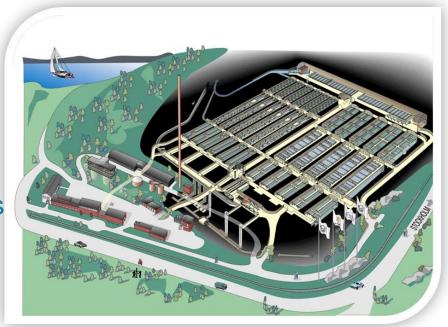
# Experiences of phosphorus recycling at the Käppala Waste Water Treatment plant

Cecilia Bertholds
Käppala Association, Sweden
Conference ESPC2 Berlin, March 5 th



#### The Käppala Association

- Cooperation between 11 municipalities in Stockholm
  - Owner and operator of the Käppala WWTP
  - Formed in 1957
  - Serves approx. 500 000 people
  - 4 millions m<sup>3</sup> of upgraded Biogas
  - 30 000 ton dewatered sludge
  - 255 ton of phosphorus





#### Sludge utilization

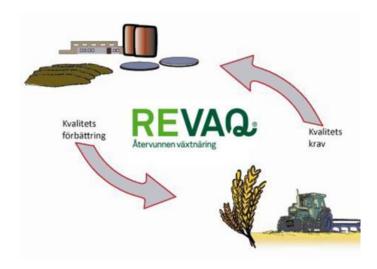
- Käppala aim to use at least 90 % sludge on farmland
- Today
  - 70 % farmland,
  - 15 % soil production
  - 15 % land restauration
- Challenges
  - Public opinion
  - Stricter regulations





### Phosphorus recycling at Käppala

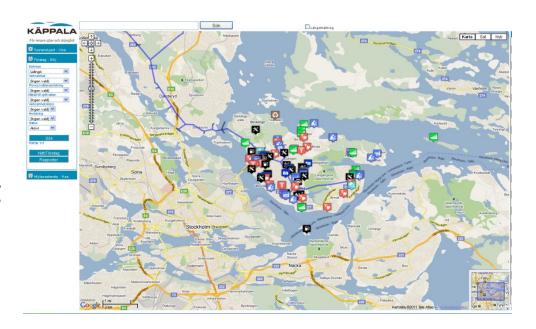
- Revaq-certified
  - Upstream work
  - Stricter metal limits
  - Pathogen control
  - Full traceability
  - Transparency
- Sludge refining
- Alternatives to sludge on farmland





#### **Upstream work**

- Preventing unwanted substances to be discharged into the sewage
- Working directly against sources of pollution
  - Industries and companies
  - Households





# Vet du varför du inte ska våttorka?

Damm drar till sig skadliga kemikalier från t ex elektronik, möbler och plast. När du våttorkar damm sköljs kemikalierna vidare ut i naturen. Dammsug istället allt ditt damm, så hjälper du till att minska kemikalierna i vår miljö.

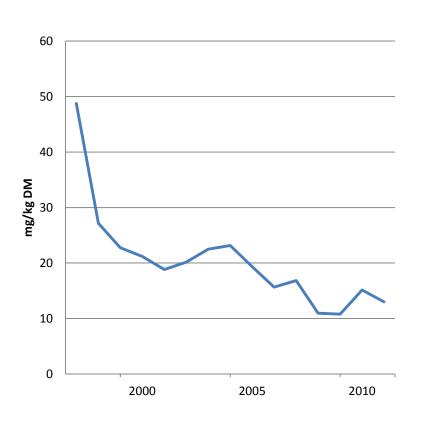
Det är enkelt att bli miljövänligare – tips och råd hittar du på www.kappala.se.



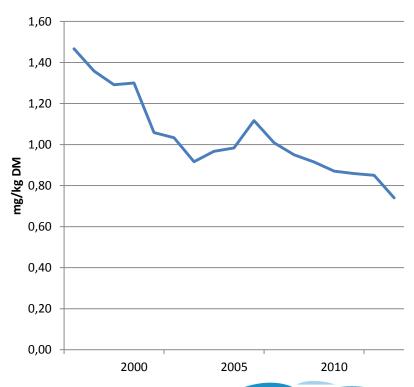
Käppalaförbundet renar avloppsvatten från mer än en halv miljon människor i elva kommuner. Reningen sker i Käppalaverket. Mer information finns på www.kappala.se

## **Upstream results**

#### Nonylphenol



#### **Cadmium**





#### Sludge refining

- Field tests where sludge is composted together with cattle manure
- Aims
  - Reducing odor
  - Degradation of organic substances
- Results
  - Significant decrease of Organophosphates, LAS, Phenols, Phthalates, PFOS





#### **Conclusions**

- By using sludge on farmland Käppala closes the rural urban nutrient cycle
- More research is needed about alternatives to sludge use on farmland where phosphorus still is recycled
- Käppala has improved sludge quality by upstream work but more has to be done
- Biggest challenge today is to decrease of diffuse sources of harmful substances
- The Revaq-certification increases the acceptance of sludge use on farmland

