

BENEFICIAL RE-USE OF BIOSOLIDS – ENVIRONMENTAL IMPACTS

Research Question

The treatment of wastewater produces biosolids however their potential re-use in our cities hasn't been realised due to their offensive odours. Benefits of biosolids re-use include biogas generation during sludge digestion, sequestration of carbon and the offset of fertilizers when applied to land. I'm researching how odours from biosolids can be reduced to increase their local beneficial re-use.

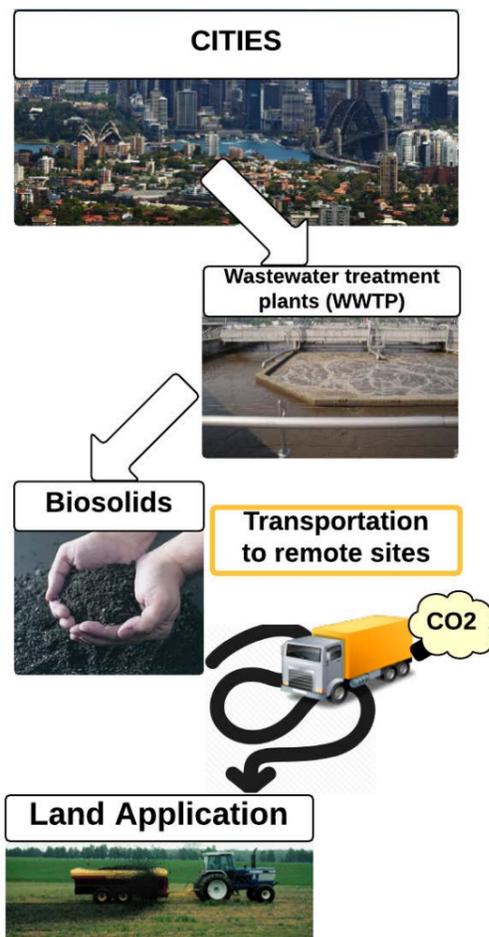


Figure 1: Biosolids are the end-product of wastewater treatment, they are currently transported long distances for disposal. Odour emissions are the barrier to local beneficial re-use opportunities

Biosolids odour emissions are the barrier to local beneficial re-use opportunities

Methodology

A database of various plant configurations and emissions have been analysed to link wastewater operation to odour impacts of biosolids. A case study is being conducted and will be finalised in early 2016. This trial is monitoring and optimising the performance of key solids processing stages relative to biosolids odour emissions.

Results

Analysis of odour emissions throughout 6 coastal wastewater treatment plants identified two processes; Anaerobic digestion and dewatering, as key to improving the odour properties of biosolids.

Variability in odour emissions were identified, prompting the longer term case study shown in Figure 2. The effect of the plant operation; the composition of the flows entering the plant; and flows throughout the plant were monitored and compared to odorous emissions from the resultant biosolids.

A range of sensory and analytical methods have been used to determine if

emissions are likely to be considered a nuisance by the public.

A range of factors such as onsite storage time, dewatering and digestion performance, events (such as heavy rains) as well as inputs to the wastewater catchment have been shown to affect the odour properties of biosolids.

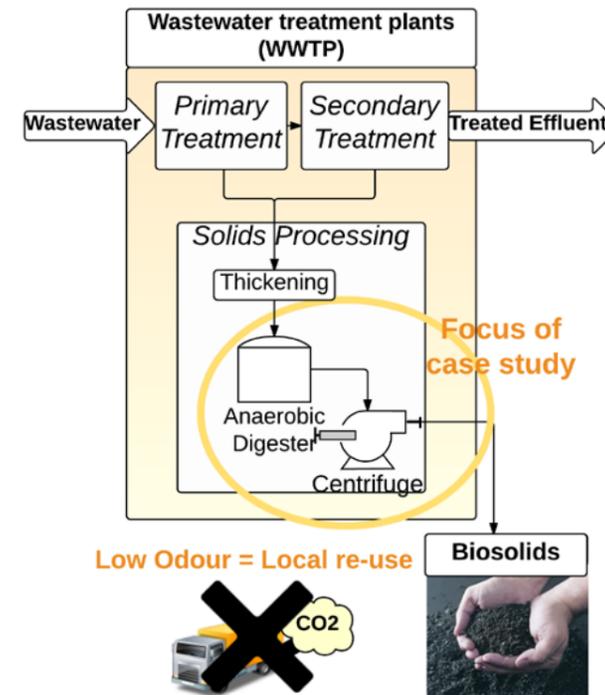


Figure 2: Wastewater treatment plants using anaerobic digestion and centrifuges for dewatering were investigated to show site specific effects on biosolids odour properties.

Conclusions

Waste management is an aspect of our cities we usually can't see, and hopefully can't smell! The production of a low

odour product will reduce barriers to local re-use, reducing carbon emissions associated with transport and providing local benefits of carbon sequestration and fertilizer offsets when applied to land.

Anticipated impacts

The work is expected to produce a Framework for the site specific prediction of odours. This will enable partner utilities Sydney Water (SW) and Hunter Water (HW) to produce biosolids for specific applications. The production of a low odour biosolids will facilitate their local re-use, helping to improve the carbon footprint of waste management in our cities.

Further information

For further information about this project UNSW's Odour Laboratory at www.odour.unsw.edu.au or the CLC for LCL website at www.lowcarbonlivingcrc.com.au

Alternatively, feel free to contact the primary researcher.

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