Odour Generation and Pathogen Regrowth after Dewatering: Are They Related?


ABSTRACT
Both biosolids odour production and pathogen indicator regrowth indicate a destabilization (or reactivation) of digested biosolids occurs after polymer conditioning and centrifuge dewatering. The objective of this research was to verify the biological reactivation of biosolids after dewatering and to link the observed fecal reactivation and odour generation during storage. Laboratory incubation simulating biosolids storage indicates that both odour generation (based on total volatile organic sulfur compound concentrations) and pathogen indicator regrowth (based on E. coli densities) follow similar formation and reduction patterns. The formation and reduction patterns of both odour compounds and fecal coliforms imply that biological reactivation and destabilization of biosolids occur after sludge conditioning and dewatering, but a secondary stabilization can be achieved soon after 1-2 weeks of storage. The occurrence of biological reactivation in biosolids is likely the microbial response to the food release through centrifuge shearing and the change of surrounding environment that a stabilized balance is broken. A full scale experiment using alum for soluble protein and organics binding showed potentials on both odour and regrowth control. This research indicates that insurance of a secondary stabilization of microbial activity in biosolids after dewatering is necessarily in order to comply with current EPA regulations.