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PII: S2213-3437(18)30569-4
DOI: https://doi.org/10.1016/j.jece.2018.09.037
Reference: JECE 2658

To appear in:

Received date: 26-6-2018
Revised date: 7-9-2018
Accepted date: 19-9-2018

Please cite this article as: Meyer T, Amin P, Grant Allen D, Tran H, Dewatering of pulp and paper mill biosludge and primary sludge, *Journal of Environmental Chemical Engineering* (2018), https://doi.org/10.1016/j.jece.2018.09.037

Dewatering of pulp and paper mill biosludge and primary sludge

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Abstract

Dewatering and handling of pulp and paper mill sludge is challenging and often comprises more than half of the overall wastewater treatment costs at a mill. Primary sludge is usually more dewaterable than biosludge (waste activated sludge), and the ratio between both types of sludge largely determines the dewaterability of the sludge mix. This study has quantified the benefits of adding primary sludge to biosludge to enhance the dewaterability in terms of cake solids and filtrate/pressate solids content. Furthermore, the effects of the particle size distribution and the monovalent to divalent cation ratio of the various types of sludge were investigated. Biosludge and three types of primary sludge from a Canadian pulp and paper mill were mixed at various ratios and tested for dewaterability using a Crown Press®, a bench-scale device which simulates industrial belt press dewatering. Results show that after addition of primary sludge at up to 40% mass proportion (dry solids basis) the dewatered cake solids content increased substantially, from 10.4% to 18.7 – 19.9%, depending on the type of primary sludge added. Further addition of