



## Centre for Bioprocess Engineering Research

University of Cape Town (UCT)

Cape Town, South Africa

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<b>Title:</b>	<b>Bioremediation of vinasse with associated value recovery through its pretreatment and anaerobic digestion</b>
<b>Abstract:</b>	Ethanol, sourced for sugarcane juice and sugar cane molasses, is a front runner in the search for sustainable biofuels, however the production of ethanol from sugarcane is threatened by the costs incurred in treating the waste water produced. This waste water, known as vinasse is produced in large quantities; for every one litre of ethanol produced, 10 – 20 litres of vinasse are generated. Vinasse generated from the fermentation of ethanol from sugar cane (juice or molasses) has been found to be highly acidic (pH 3-5), contain a high COD loading (10 – 50 g/L) as well as high salts and sulphur concentrations. Previous studies on treating vinasse by anaerobic digestion found that vinasse poses a great challenge for waste water remediation with poor performance of AD reactors. In this study value addition to the remediation of vinasse is proposed through the recovery of salts and complex molecules through pretreatment, augmenting subsequent anaerobic digestion for energy recovery. The achievement of effective bioremediation of vinasse with the inclusion of a value addition step has potential to improve the sustainability of vinasse remediation, reduce the limitations of ethanol production, enhance resource productivity and improve the process economics.
<b>Lead institution:</b>	University of Cape Town
<b>Partner institutions:</b>	Sugar Milling Research Institute (SMRI)
<b>Student name:</b>	Edith Mshoperi
<b>Supervisor name:</b>	Prof. S Harrison, Dr. Madelyn Johnstone-Robertson
<b>Degree:</b>	PhD
<b>Funded by:</b>	CeBER, SMRI
<b>Start date:</b>	June 2015
<b>End date:</b>	2018
<b>Feedstock:</b>	Sugar cane molasses vinasse
<b>Value chain products:</b>	Potentially methane, phosphorous, potassium and bio fertilizer
<b>Geographic source of the feedstock:</b>	Eastern South Africa (KwaZulu-Natal, Eastern Cape and Mpumalanga)