



Newlands Mashu Research Site



Integrated research on sanitation, decentralised wastewater treatment, nutrient recovery and recycling, and agriculture



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Bremen Overseas Research & Development Association (BORDA)

South African Water Research Commission (WRC)

Swiss Federal Institute of Aquatic Science and Technology (Eawag)



Research Projects:

Whole effluent sampling system

A whole effluent sampling system is being designed for the head of the works in order to obtain an indication of the characteristics of the effluent entering the Anaerobic Baffled Reactor (ABR).

Contact person: Dr Tina Velkushanova: Velkushanova@ukzn.ac.za

Anaerobic baffled reactor

The ABR and Anaerobic Filter at Newlands Mashu are closely monitored by a PhD student who also works for BORDA. Samples are taken from the various chambers at regular intervals for monitoring purposes.

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Wetlands

There are two full scale constructed wetlands at Newlands Mashu – a vertical flow and a horizontal flow operating in series. A PhD student is undertaking a performance evaluation of the vertical flow constructed wetland as a post treatment from decentralised wastewater treatment systems (DEWATS) in South Africa.

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Membranes

A more recent project under investigation at Newlands Mashu is the use of low pressure membranes to treat the ABR effluent. This is under developmental stages.

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Urine reactors

Collection of urine to produce a nitrified urine concentrate to be used in agricultural trials. Current trials are done comparing nitrified urine concentrate (NUC), struvite as fertilisers to commercial fertiliser on rye grass and maize. More trials are in the pipeline.

Contact person: Lungi Zuma: Lungi.Zuma@durban.gov.za

Agricultural field trials

Investigating the irrigation management practices for irrigating crops with DEWATS effluent in order to determine the amount of land that can be irrigated annually with a certain amount of DEWATS effluent in different crops and soils.

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Hydroponics

Determining the nutrient uptake, growth and yield of Duckweed in a hydroponic system with ABR effluent as nutrient source.

Contact person: Shola Oyawoye: habydemitemi@gmail.com

Urine based products

Investigating the effects of urine- derived plant nutrient sources on perennial rye grass (*Lolium perenne*) and maize (*Zea mays*) growth and biomass production.

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Excreta derived nutrient resources

Undertaking an economic evaluation of excreta derived plant nutrient sources - Latrine Dehydrated and Pasteurisation ("LaDePa") pellets, struvite and nitrified urine concentrate (NUC).

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Microbial risk assessment

Determining the pathogen removal efficiency of DEWATS plant and risk assessment for effluents used in agriculture.

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