

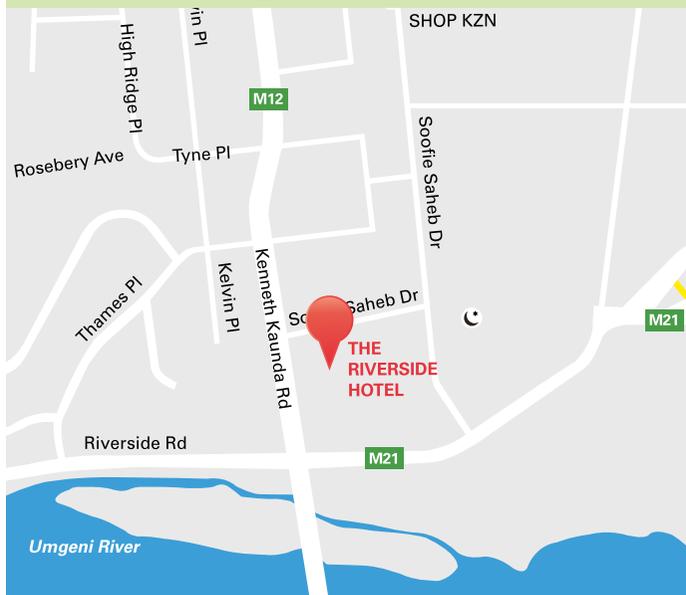
Venue details

Riverside Hotel
10 Kenneth Kaunda Road (Northway), Durban North, 4065

GPS Co-ordinates:
Latitude - 29°48'25.95"S
Longitude - 31° 1'55.41"E

From King Shaka International Airport follow the exit at the airport leading you to N2 South. After 2.8 kms take exit 190 to merge onto M27 toward Umdloti. After 1.0 km, turn right to merge onto M4 towards Ballito. After 15 kms, take exit 3 toward M21/Riverside Road/Prospect Hall Road/Waterkant Road. Turn right toward M21. Keep right to continue toward M21. After 300m, turn right onto M21. After 200m, turn right onto Soofie Saheb Drive. Riverside Hotel will be on the left.

From CBD drive down Dr Pixley KaSeme Street (West Street) and turn left into Samora Machel Street (Aliwal Street), continue straight along, Samora Machel Street (Aliwal Street) will become Masabalala Yengwa Avenue (NMR Avenue) and then Kenneth Kaunda Road (Northway) as you cross over the Umgeni (Athlone Bridge). The Riverside Hotel is situated on the right.



Overview text

As part of the Integrated Development Plan (IDP) eThekweni Water and Sanitation (EWS) pioneered a programme providing urine diversion dehydration toilets (UDDT) to households in unserved rural and peri-urban areas. The purpose of urine diversion was to enhance the drying of faeces. The urine itself, containing most of the excreted nutrients, was infiltrated and lost to the ground.

In 2010, the Swiss Federal Institute of Aquatic Science and Technology (Eawag), eThekweni Water and Sanitation (EWS), the University of KwaZulu-Natal (UKZN), and the Swiss Federal Institute of Technology Zurich (ETHZ), jointly launched the VUNA project to develop technologies and methods for managing urine collected from UDDTs.

By recovering nutrients from urine, the VUNA project aims to

- improve hygiene and sanitation by giving excreta an added value both economically and socially,
 - protect the environment, in particular water resources, from excessive nutrient input and harmful substances,
 - recover nutrients and make them available as agricultural input.
- In this symposium the partners of the VUNA project will present results from the various aspects of the VUNA project. Sanitation experts will assess the achievements of the VUNA project and discuss the opportunities and challenges of urine separation as a sanitation system for South Africa. The target audience are stakeholders, researchers and the interested public in South Africa.

Eawag –
Swiss Federal Institute of Aquatic
Science and Technology

VUNA symposium 2015

Symposium for stakeholders, August 27, 2015
8.30–17.30 at the Riverside Hotel in Durban



Cover picture: Glynn Erasmus, ERA design, Durban, South Africa



Program of the VUNA symposium 2015

8.30–9.30 Registration / Tea / Coffee

9.30–9.40 Welcome *Kathy Eales, moderator*

9.40–10.00 **South Africa's strategy for sanitation: It's not all about flushing** *Andre van der Walt, Chief Director: Sanitation*

Without provision of sanitation, ill-health dominates a life without dignity. Despite its importance, achieving real gains in sanitation coverage has been slow. Many South African households are still at risk of service failure. The responsibility now rests on the water and sanitation sector to provide demonstrated innovations and sanitation technologies that can have real impact on the ground. For this to be achieved, a dialogue between communities, technology developers, and decision-makers is needed.

10.00–10.20 **Why urine separation in eThekweni**

Neil Macleod, former Head of EWS

EWS introduced urine diversion dehydration toilets (UDDTs) as a response to the municipal elections in 2002, when the metropolitan area of Durban was extended to include an additional 60'000 households without sanitation. UDDTs were chosen because waterborne sewerage could not be provided and conventional pit latrines posed significant management challenges. Although nutrient recovery was not an initial goal of implementing UDDTs, it was later identified as an important asset of this sanitation system.

10.20–10.40 **The VUNA project: purpose, packages and partners** *Kai Udert, PI VUNA, Eawag*

Successful implementation of urine separation requires reliable treatment technologies, which ensure maximum nutrient recovery without posing any risks to the environment and human health. However, there are further aspects, which decide about the success of this novel sanitation approach: user acceptance, urine transport and the overall economic feasibility. All these aspects have been investigated by a research team consisting of partners from South Africa and Switzerland.

10.40–11.00 Break

11.00–11.20 **Treatment processes to recover nutrients from urine** *Bastian Etter, project coordinator VUNA, Eawag*

Three treatment processes for urine have been investigated in the VUNA project. Struvite precipitation allows the recovery of phosphate as a slow release fertilizer. The effluent of the process requires further treatment. A combination of nitrification and distillation produces a highly concentrated nutrient solution. By-products are distilled water and minor amounts of activated sludge. Finally, we investigated electrolytic nitrogen removal as an alternative to the production of a nitrogen fertilizer.

11.20–11.40 **Producing a risk-free fertilizer: hygiene and pharmaceuticals** *Loïc Decrey, researcher, EPFL*
Urine collected in diversion toilets is not sterile: it contains pathogens, mainly from cross-contamination with faeces. Besides pathogens, urine also contains other unwanted compounds, especially pharmaceutical residues for example antibiotics or antiretroviral drugs. We analysed urine samples from eThekweni and after characterizing the critical compounds, we investigated, whether these compounds are removed during urine treatment and which additional process steps could improve the removal.

11.40–12.00 Discussion

12.00–13.00 Lunch

13.00–13.20 **Urine separation as a business: the main cost factors**

Heiko Gebauer, group leader, Eawag

Besides treatment, excreta transport is the main cost factor of sanitation systems. In the case of UDDTs, the urine has to be collected by professional staff or it can be brought to a collection point by the toilet users themselves. Both options have been investigated in the VUNA project. Computer simulations have shown that a good planning of the logistics can significantly reduce the financial costs: if reactor size and collection logistics are optimized, fertilizer revenues could cover the costs.

13.20–13.40 **Improving acceptance, use and maintenance through health and hygiene education**

Nosipho Mkhize, social worker, EWS.

The social acceptance component of this project is vital because effective sanitation is not only about providing a well-designed toilet and effective waste management, but also about providing users with a facility that caters to their needs and is sensitive to their cultural lifestyle. The social aspects of the study used qualitative and quantitative approaches to investigate acceptance of UDDTs and to explore the role of health and hygiene education in promoting acceptance, usage and maintenance of the UDDT.

13.40–14.00 **Improving sanitation with transformative technologies**

Carl Hensman, project officer, BMGF

The Bill and Melinda Gates Foundation's Water, Sanitation and Hygiene program focuses on developing innovative approaches and technologies that can lead to radical and sustainable improvements in sanitation. A key part of the effort is to develop transformative technologies. The VUNA project is one of many initiatives in this area including the Reinvent the Toilet Challenge (RTTC). While many projects address faecal sludge treatment, VUNA is one of the few projects that focuses on processing source-separated waste streams.

14.00–14.20 Break

14.20–14.40 **Urine as a fertiliser? Perspectives of the fertiliser industry** *Devin Vinnicombe, Kanofield*
Enhancing soil quality for better water retention, availability of the most important nutrients and microbial activity requires addition of nutrients and other substances into nutrient poor soils. The concentrated urine product was introduced into our soil additives manufacturing process, the initial testing yielded positive results. This innovative product provides a wide spectrum of nutrients including micronutrients. However, some factors like the sodium content remain a concern.

14.40–15.00 **VUNA in South Africa: Opportunities for scaling up,** *Valerie Valerie Naidoo, Water Research Commission, South Africa*

It is projected that future demands will lead to a phosphorus deficit but it is believed this deficit can be managed through increased P use efficiency and P recovery and reuse. Phosphates may be recovered from wastewater or directly from urine as fertiliser. The recovery of P from urine is considered a better route as it only makes up about 1% of the wastewater but can contain up to 80% N and 50% P. Several areas of research have been explored based on various possible scenarios of implementing such a concept.

15.00–15.20 **Final discussion** *Kathy Eales, moderator*

15.20–15.30 **Closing remarks** *Ednick Msweli, Head of EWS*

The VUNA project has helped EWS to evaluate the many aspects of a sanitation system based on nutrient recovery from source-separated urine. The general approach of VUNA is in line with the general objectives of EWS: provision of adequate sanitation, protection of the environment and recovery of valuable products. The development of cost effective technologies for nutrient recovery will assist in ensuring that these sanitation solutions are aspirational to both the rich and the poor.

15.30–17.30 **Site tour of Newlands Mahsu Research Facility followed by a cocktail reception**

[Click here to register for the symposium](#)

For more details on the project, please visit:
www.vuna.ch