Additional Resources

Specific sampling and data requests
- Sampling and data analyses on various excreta streams undertaken on request.

Sanitation tour
- Exposure to the contrasts of first-world city living to the rural environment
- Overview of the various sanitation systems installed within eThekwini .

Field testing
- Installation of prototypes in the field and support through laboratory analyses and hands on assistance from highly skilled technical staff.

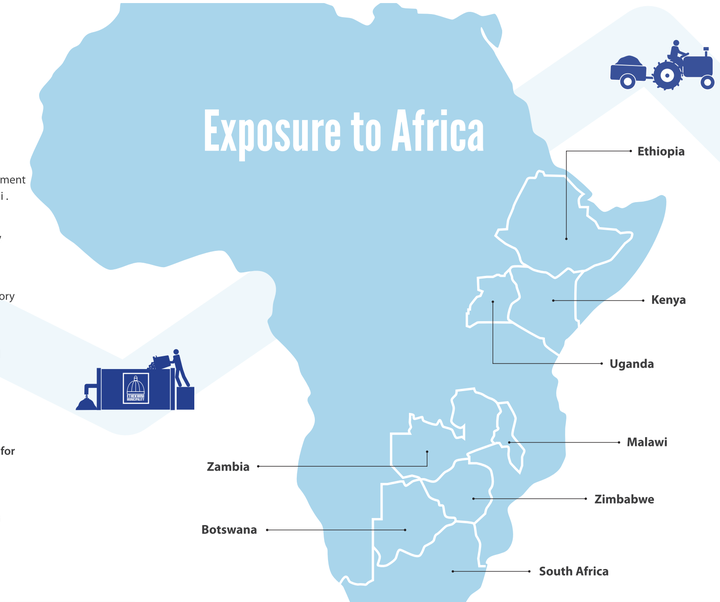
Hosting of visitors
- Visitors are welcomed to Durban and assisted in undertaking laboratory and field experiments.

Data from other African countries
- Partner institutions in African countries are obtaining data from local sanitation systems under guidance from PRG.

Interactions with Other Organisations

The PRG and EWS interact with other organisations to provide input for their projects. This includes:

- Projects funded by the Bill & Melinda Gates Foundation
- Projects funded by the South African Water Research Commission
- Projects funded by the Bremen Overseas Research and Development Association (BORDA)
- Projects undertaken by other Gates grantees



Who to contact

If you are looking for more information on what we can offer or would like to arrange a visit to Durban, please make contact with us.

Pollution Research Group
www.prg.ukzn.ac.za

Chris Buckley
Head of Pollution Research Group
buckley@ukzn.ac.za

Konstantina Velkushanova
Project Engineer
Velkushanova@ukzn.ac.za

Susan Mercer
Project Co-ordinator
mercer@ukzn.ac.za

Merlien Reddy
Laboratory Manager
Reddym5@ukzn.ac.za

Kerry Philp
Project Administrator
Philpk@ukzn.ac.za

Santiago Septien
Post-Doctoral Researcher
santiago.septien@hotmail.com

eThekwini Water and Sanitation Unit
www.durban.gov.za

Neil Macleod
Head of Water and Sanitation Unit
Neil.Macleod@durban.gov.za

Max Grau
Project Engineer
Max.Grau@durban.gov.za

Teddy Gounden
Manager Special Projects
Teddy.gounden@durban.gov.za

Dave Wilson
Area Engineer
Dave.Wilson@durban.gov.za

WATER AND SANITATION

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

Grant information

Project Name:
Data Acquisition and Field Support for Sanitation Projects

Organisation Name:
University of KwaZulu-Natal (Pollution Research Group), South Africa

Funded by:
Bill & Melinda Gates Foundation

Foundation Programme Manager:
Carl Hensman

Project Information

Date awarded
15th May 2013

Project end date
31st July 2014

Grant amount:
$ 898,150.00

Principle investigator:
Prof Chris Buckley

Sub-grantee:
eThekwini Municipality, Water and Sanitation Unit

Who we are

Pollution Research Group (PRG)

- A professional research group formed in 1969 in the Chemical Engineering Department of the University of KwaZulu-Natal
- Undertake contract research into water, wastewater and sanitation management through a sustainability approach.

eThekwini Water and Sanitation Unit (EWS)

- Responsible for the provision of water and sanitation services to more than 3.7 million people within the eThekwini municipal boundaries
- Serve both urban and rural areas

A History of Collaboration

2003: Signing of a Memorandum of Understanding between eThekwini Municipality, University of KwaZulu-Natal, Durban Institute of Technology and Mangosuthu Technikon to strengthen collaboration on research

2006 (to 2012): Signing of a Memorandum of Agreement specific to collaboration between EWS and PRG

2013 (to 2015): Signing of a second Memorandum of Agreement between EWS and PRG

These agreements formalised the desire of both parties to promote and expand the knowledge base, research capacity and expertise in water and sanitation delivery.

The Sanitation Challenge

Key Attributes of the Collaboration

- Research based approach
- Good science makes good policy

The Durban Situation

- Durban faced with rapid urbanisation leading to creation of informal settlements with limited access to sanitation
- Remote rural areas off the water-borne edge
- Looming water shortage makes dry sanitation attractive
- Open defacation presents a health and environmental risk
- A need to provide suitable, affordable and hygienic sanitation solutions

Existing Sanitation Technologies:

- 32 000 ventilated improved pit latrines (VIPs) emptied every 5 years by EWS
- 85 000 urine diversion dehydration toilets (UDDTs)
- 520 community ablution blocks (CABs) linked to VIP or sewer

Bill & Melinda Gates Foundation Reinvent the Toilet Challenge

Phase I

Data and Design – Mineralisation of Sanitation Wastes from Community Ablution Blocks

- Collection and analysis of segregated human faecal samples
- Development of a three-way splitting pedestal prototype and design for the extrusion/separation, drying, and combustion of faeces and solids; and a three-stage membrane process for treating contaminated urine (microfiltration, nanofiltration and forward osmosis)

Phase II

Data Acquisition and Field Support for Sanitation Projects

- Builds on Phase I experimentation
- Aims to characterize physical and chemical properties of excreta streams from dry on-site sanitation systems or from decentralized low-water consuming sanitation systems.
- Provides support to other grantees for the development of prototypes

In the laboratory

In the field

What we can offer

Gates grantees require data for the design of their prototypes. We can provide this through the following services:

Analyses and Data Collection:

- Existing and new experimental data on a range of excreta streams
- Sampling of various sanitation systems
- Range of chemical, mechanical and biological analyses
- Sampling protocols, methods of analysis and data interpretation

Research projects:

Detailed Masters research projects designed to support the overall project aims:

- Thermal properties and drying characteristics of faecal sludge
- Rheology, extrusion and palletisation of faecal sludge
- Forward osmosis as a final step in the recovery of water from urine
- Micro-filtration of liquid excreta streams
- Nano-filtration of liquid excreta streams
- Separation products of urine

Access to Field Sites:

- **Newlands Mashu**
  - Urine processing (struvite and nitrification reactors)
  - BORDA/DEWATS demonstration plant
  - Agricultural trials (growing tunnels and field trials)
  - UDDT prototypes
- **Tongaat Wastewater Treatment Works**
  - LaDePa pelletiser for processing VIP sludge
- **Northern Wastewater Treatment Works**
  - Space for testing of larger prototypes
- **Marianhill Wastewater Treatment Works**
  - Proposed site for investigating the use of black soldier fly larvae to degrade UDDT sludge