Wastewater: A valuable resource
Municipality of Windhoek

Improve water security

To enhance the quality of life of all our people

2541 Staff members
Windhoek

Location: in the driest country in Sub-Saharan Africa

Annual water consumption: **27 Million m³/annum**

Population: **341,000** (2011 Census Survey)
**431,700** (growth rate 4.3%)(current)

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Economic hub
Water Security Uncertainty

- High population growth rates increasing the water demand
- Repeated Irregular rainfall patterns
- Annual rainfall: 300-400mm
- Annual Evaporation: 3000-3500mm
- Regular droughts
- Ephemeral rivers are fully harnessed
- Perennial sources are located too far away
- Perennial rivers are national borders
- Potable water sources within close proximity have been fully exploited
Windhoek: Timeline of the potable water supply scheme

- **1800s**
  - Hot Natural Springs

- **1911**
  - Development of well field

- **1933**
  - Construction of the Avis Dam (2.4 Mm³)

- **1957**
  - Well field over abstracted (>50%)

- **1958**
  - Construction of Goreangab dam (3.6Mm³)

- **1968**
  - Direct potable reclamation (21MLD)

- **1970s**
  - Construction of NAMWATER’S three (3) surface dams (155.60Mm³)

- **1990s**
  - (CAN supply scheme)-ongoing
Windhoek: Current potable water supply scheme

- Groundwater (Boreholes)
- Surface (dam) water (NamWater) (155.6Mm³)
- Reclaimed water (NGWRP) (21MLD)
  - Raw water supplied by GAMMAMS WCW WWTP (25MLD)

Semi-purified water for irrigation (OGWRP)
- Decrease water demand by 8%

Potable water supply (Windhoek)
Windhoek: Current potable water supply scheme
Water demand/consumption by source

- Borehole water
- Surface dam water (NamWater)
- Semi-purified water for irrigation
- Reclaimed water
- Population

Period (year)

Population (Thousands)

Annual consumption (Mm³)
Water demand/Consumption

Period (year)

Water consumption (m³/annum)

Drought year

Water consumption

GAPWAS
German-African Partnership for Water and Sanitation

Every Drop Counts

 Valorising the end-products of domestic and industrial wastewater treatment

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Valorising the end-products of domestic and industrial wastewater treatment

Gammams WCW WWTP
Gammams WCW WWTP

• An activate sludge/trickling filter plant
• Commissioned in 1963
• Capacity: 25MLD
• Treatment of domestic sewage
• The biggest WWTP in Windhoek/Namibia
• The effluent serves as raw water used to feed a DPR plant
Gammams WCW WWTP influent volume vs Raw and product water of NGWRP

- Flood
- Raw water intake (from Gammams WCW WWTP)
- Potable water produced by the NGWRP to the distribution system
- Gammams WCW influent wastewater

Every Drop Counts
The way forward: water security

Water reuse is well known as the main alternative to reduce water demand/consumption (Abdel-shafy, & Mansour, 2020).

- Increasing of the reuse potential
  - DPR2 project was identified as one of the medium-term interventions
    - Additional upgrades are required at Gammams and Otjomuise WCW WWTP
Thank you for your attention!

Any Question?

Ms Justina Haihambo  
Process Engineer  
City of Windhoek  
Justina.Haihambo@windhoekcc.org.na  
Tel: +264 61 290 2778