• Water has been ranked by the World Economic Forum’s Global Risk Report as one of the biggest threats facing the planet over the next decade. This threat is amplified:
  • in water scarce regions like South Africa;
  • in companies with large and complex footprints like Sasol (compared to our peers we have an unusually large water demand from water scarce regions).

• Water has strategic importance for Sasol due to our upstream manufacturing activities.

• Companies that identify the lack of water as a significant risk to their business are taking action via improved water management practices referred to as corporate water stewardship.

• Water stewardship is a stakeholder-inclusive process that involves site-and-catchment based actions to decrease water risk exposure.

• Sasol has been a signatory to the UN Global Compact CEO Water Mandate since 2007 and has adopted the mandate’s water stewardship framework in responding to water risks.

• Driving water partnerships is advocated by the UNGC CEO Water Mandate (collective action and community engagement).
Water stewardship is about responding to a shared challenge, taking collective responsibility and being transparent and accountable.

Risk facing the Integrated Vaal River System (IVRS)

Vaal system water demand per sector (total demand 2900 mil.m³/a)

- 4% Sasol
- 42% Domestic
- 17% Domestic Losses
- 41% Irrigation
- 6% Unlawful Irrigation
- 13% Eskom
SA stats*(WRP,2017):
  • Non-revenue water is close to 37%.
  • 45% of municipalities have poor/no water loss information and plans.
  • Average water consumption in SA is 238 L/capita/day as opposed to international which is 178 L/c/d.

The Department of Water and Sanitation (DWS) Response:
  • Reconciliation Strategy identified meeting 15% savings target in reducing urban water losses by Municipalities as a significant opportunity in bringing the IVRS into balance.
  • Appeal to the private sector to support Government initiatives in water conservation/water demand management (WC/WDM).
  • The DWS included the development of a Water Offsetting Policy (being revised to Water Stewardship framework policy) in the National Water Resource Strategy 2 (NWRS2) as an incentive for Business to participate.
  • In discussion with the DWS to consider merging the 2 policies to be called Incentive Based Partnership Policy Framework.
  • A company may offset for good corporate stewardship, or may seek a regulatory benefit such as higher-priority access to water in times of drought
  • (Hastings & Pegram; 2012)

Sasol has concluded that water security for our operations can be improved in a more meaningful way by saving water beyond our factory fence line.

*WRP, Status Report on Water Losses within the 8 large water supply systems, March 2017.

War on Leaks in Metsimaholo Local Municipality – A Case for Water Offsets

Summary:
  • Sasol is involved in a water conservation/water demand management project for MLM in Sasolburg, in collaboration with Rand Water, GiZ and the DWS.
  • A feasibility study completed in 2012 concluded that the focus of the MLM War on leaks project should be in the Greater Zamdela area.
  • The DWS contributed R4 million (baseline establishment), Sasol R2.9 million (advanced pressure management) and GiZ 60,000 Euros (education and awareness raising).
  • The partnership support contributed to MLM achieving a reduction in potable water demand in the greater Zamdela area by 23% (3.1 ML/day) due to pressure reduction (equates to savings of approx. R9 million/annum).
  • Saving equates to offsetting 5% of SO’s raw water demand (60 ML/day) and 72% of SO’s potable water demand (4.3 ML/day).
Greater Zamdela Zone Layout

Scope of Work

- Baseline Establishment
- Advanced Pressure Management in Zamdela and Harry Gwala
- Harry Gwala Reservoir Complex Remedial Works
- Large Consumer Meter Audits and Meter Installations
- Large Consumer Meter Monitoring
- Control Valve Training
## Greater Zamdel KPI Summary

<table>
<thead>
<tr>
<th>AREA</th>
<th>NO. PROPERTIES</th>
<th>ESTIMATED POPULATION PER PROPERTY</th>
<th>ESTIMATED POPULATION</th>
<th>MEASURED DAILY DEMAND (m³/day)</th>
<th>DEMAND / HOUSEHOLD / MONTH (m³)**</th>
<th>LITRE / CAPITA / DAY **</th>
<th>MNF / AVERAGE</th>
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<tbody>
<tr>
<td>Zamdel</td>
<td>7386</td>
<td>8</td>
<td>44316</td>
<td>11 448</td>
<td>47.1</td>
<td>258</td>
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<tr>
<td>Harry Gwala</td>
<td>3285</td>
<td>5</td>
<td>16325</td>
<td>3 568</td>
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<tr>
<td>Zamdel X13</td>
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<td>4</td>
<td>21352</td>
<td>5 659</td>
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<td>Amelia</td>
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<tr>
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<td>1556</td>
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<tr>
<td>Holly Country</td>
<td>208</td>
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<td>832</td>
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<td>N/A</td>
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<td>19736</td>
<td>4.9</td>
<td>96681</td>
<td>18 294</td>
<td>28.2</td>
<td>189</td>
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</tr>
</tbody>
</table>

*MNF = Minimum Night Flow

**Norm Average = 15 – 20 m³/month

**Norm Average = 100 - 130 ℓ/capita/day

## Pressure Reducing Valve Installation (PRV) in Zamdel & Harry Gwala Zones

![Pressure Reducing Valve Installation (PRV) in Zamdel & Harry Gwala Zones](image_url)
PRV Installation Designs

250mm PRV Installation Pipeline details (Zamdela Pipeline 3)

Zamdela 3 PRV Construction
Pressure Controller Installations

Results – Upstream Vs Downstream Pressure

![Graph showing upstream vs downstream pressure](image)
Average Daily Demand (ADD) Change for Zamdela & Harry Gwala

Financial Savings

<table>
<thead>
<tr>
<th>Area</th>
<th>Baseline ADD (m³/day)</th>
<th>Current ADD (m³/day)</th>
<th>Daily Savings (m³/day)</th>
<th>Monthly Savings (m³/month)</th>
<th>Yearly Savings (m³/year)</th>
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</thead>
<tbody>
<tr>
<td>Zamdela</td>
<td>11 448</td>
<td>8 424</td>
<td>3 024</td>
<td>91 980</td>
<td>1 103 760</td>
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<tr>
<td>Harry Gwala</td>
<td>3 558</td>
<td>3 153</td>
<td>405</td>
<td>12 319</td>
<td>147 825</td>
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<tr>
<td>Total</td>
<td>15 006</td>
<td>11 577</td>
<td>3 437</td>
<td>104 299</td>
<td>1 251 585</td>
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Using Rand Water Tariff

<table>
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<th>Area</th>
<th>Daily Savings (R/day)</th>
<th>Monthly Savings (R/month)</th>
<th>Yearly Savings (R/year)</th>
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<tr>
<td>Zamdela</td>
<td>R 22 861</td>
<td>R 695 369</td>
<td>R 8 344 426</td>
</tr>
<tr>
<td>Harry Gwala</td>
<td>R 3 062</td>
<td>R 93 130</td>
<td>R 1 117 557</td>
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<tr>
<td>Total</td>
<td>R 25 923</td>
<td>R 788 499</td>
<td>R 9 461 983</td>
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Large Consumer Meter Audits and Meter Replacements

- 15 top consumers were audited.
- Design for new meters.
- Installation of 11 Consumer (budget constraints)
- Temporary Logging of meters

Summary of Large Consumer Logging Results to Date

<table>
<thead>
<tr>
<th>LARGE CONSUMER</th>
<th>AVERAGE FLOW RATE (M³/H)</th>
<th>MINIMUM NIGHT FLOW (M³/H)</th>
<th>AVERAGE DAILY CONSUMPTION (M³/DAY)</th>
<th>ESTIMATED LEAKAGE (M³/DAY)</th>
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<tbody>
<tr>
<td>1</td>
<td>22.6</td>
<td>13.9</td>
<td>538</td>
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<td>2</td>
<td>5.5</td>
<td>4.6</td>
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</tr>
<tr>
<td>3</td>
<td>0.3</td>
<td>0</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
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<tr>
<td>5</td>
<td>15</td>
<td>12.7</td>
<td>315</td>
<td>274.3</td>
</tr>
<tr>
<td>6</td>
<td>10.5</td>
<td>6.5</td>
<td>253</td>
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<tr>
<td>8</td>
<td>8.5</td>
<td>6.4</td>
<td>137.8</td>
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<tr>
<td>9</td>
<td>1.9</td>
<td>1.6</td>
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<td>34.6</td>
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<td>0</td>
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<td>11</td>
<td>0.67</td>
<td>0.4</td>
<td>15</td>
<td>0</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>987</strong></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Lessons Learnt in Water Partnership Projects

• Leak reduction projects should be done on a large enough scale to see savings on bulk purchases.
• A proper baseline needs to be established in order for losses to be measured.
• Municipality needs to dedicate resources to the project.
• Project Management is required for the success of partnership projects.
• Ensure that partners contribute equally in the process.
• Education and awareness on water conservation needs to be ongoing and part of the municipalities business model for sustainability of such a project.
• Proper project governance needs to be administered.
• Stakeholder management – communities and political stakeholders needs to be kept informed.
• Assess beneficiaries capabilities to ensure sustainability.
Conclusion and Recommendation

• The Zamenda water loss reduction project was a success; there are still opportunities for further leakage reduction.

• Sasol is aligned to a stakeholder approach in mitigating our water risks hence we support water partnerships.

• Municipalities are under immense pressure to meet their WCWDM targets hence this case study demonstrates a need for incentives for private sector investment beyond the factory fence-line.

• It is therefore recommended that the DWS enable incentives like Water Offsetting to be recognised in law to attract private sector investment in Public infrastructure.