



European Union-South Africa Partners for Growth

# Barriers and opportunities for water reuse PPPs in South Africa

Final draft paper

20 December 2019

## Contact Details

Contact	Nick Graham
Postal address	PO Box 46830, Glosderry, 7702
Physical address	Ubunye House, 1 <sup>st</sup> floor, 70 Rosmead Avenue, Kenilworth, Cape Town, 7708
Telephone	(+2721) 671 1402
Facsimile	(+2721) 671 1409
Cell phone	+2783 262 1028
E-mail	<a href="mailto:nick@pdg.co.za">nick@pdg.co.za</a>

## Acronyms

---

B-BBEE	Broad-Based Black Economic Empowerment
BOT	Build–Operate–Transfer
BOOT	Build-Own-Operate-Transfer
DBSA	Development Bank of Southern Africa
DCOG	Department of Cooperative Governance
DEA	Department of Environmental Affairs
DFI	Development Finance Institution
DPR	Direct Potable Reuse
DWS	Department of Water and Sanitation
EU	European Union
EU-SA	European Union-South Africa
GTAC	Government Technical Advisory Centre
IFC	International Finance Corporation
IIPSA	Infrastructure Investment Programme for South Africa
IMP	Industrial, Mining and Power generation
MFMA	Municipal Finance Management Act
MISA	Municipal Infrastructure Support Agency
MSA	Municipal Systems Act
NDP	National Development Plan
NWA	National Water Act
NWRSII	National Water Resource Strategy (Version II)
PPP	Public-Private Partnership
PPPFA	Preferential Procurement Policy Framework Act
RMB	Rand Merchant Bank
RWST	Rustenburg Water Service Trust
SAPREF	South African Petroleum Refineries
SCM	Supply Chain Management
SPV	Special Purpose Vehicle
W&WWE	Water and Wastewater Engineering
WISA	Water Institute of Southern Africa
WRC	Water Research Commission
WSA	Water Service Authority
WSP	Water Service Provider

# Contents

---

- Acronyms..... i
- Executive Summary ..... i
- 1 Introduction ..... 1**
  - 1.1 Project background..... 1
  - 1.2 Water resource situation ..... 1
  - 1.3 Institutional context for water provision ..... 3
  - 1.4 Water services financing..... 4
  - 1.5 Market for water reuse in South Africa ..... 5
- 2 Legislative and policy context for water reuse PPPs ..... 6**
  - 2.1 Legislative context ..... 6
    - 2.1.1 National Water Act (NWA) 6
    - 2.1.2 Municipal Systems Act (MSA) 6
    - 2.1.3 Municipal Finance Management Act (MFMA) 7
    - 2.1.4 Preferential Procurement Policy Framework Act (PPPFA) 8
  - 2.2 Policy context ..... 8
  - 2.3 South African definition of a PPP ..... 9
- 3 Barriers to water reuse PPPs ..... 10**
  - 3.1 Regulatory barriers ..... 10
  - 3.2 Capacity barriers..... 12
    - 3.2.1 Municipal capacity 12
    - 3.2.2 National capacity 13
    - 3.2.3 Private sector capacity 14

3.3	Political barriers .....	14
3.4	Financial barriers .....	15
3.5	Technical barriers .....	17
<b>4</b>	<b>Potential measures to address barriers to water reuse PPPs .....</b>	<b>18</b>
4.1	Regulatory.....	18
4.2	Capacity .....	20
4.3	Political .....	21
4.4	Technical.....	21
4.5	Financial.....	21
<b>5</b>	<b>Potential role for European businesses .....</b>	<b>22</b>
<b>6</b>	<b>References.....</b>	<b>25</b>
6.1	Relevant legislation.....	25
6.2	Bibliography.....	25
	<b>Annexure A: Case studies .....</b>	<b>28</b>
1.1	Durban Water Recycling .....	28
1.2	Drakenstein non-potable water reuse project .....	29
1.3	Beaufort West water reuse .....	30
1.4	City of Cape Town indirect water reuse.....	30
1.5	Rustenburg .....	31
1.6	City of uMhlathuze non-potable water reuse project for industries .....	32
1.7	Overstrand water treatment 15-year contract.....	32
1.8	Saldanha Bay industrial water use .....	32
1.9	Water reuse in Olifants River catchment.....	33
	<b>Annexure B: Interview schedule .....</b>	<b>34</b>

## Executive Summary

---

### Introduction

The European Union-South Africa (EU-SA) Partners for Growth Programme supports the European Union (EU) Delegation in its efforts to maximise bilateral trade between the European Union and South Africa. The concept of a circular economy has become mainstreamed in the EU but has not reached legislated status in South Africa. The Circular Economy component of the EU-SA Partners for Growth Programme has chosen to focus on water reuse PPPs specifically because of the projected water shortages and the policies of the South African government to encourage private sector involvement in resolving the current water crisis. South Africa is on an unsustainable water consumption path, with demand projected to outstrip supply in the medium term. While the need for water reuse in South Africa is widely acknowledged, municipalities face significant capital constraints to develop alternative water sources. The programme believes there is scope for mutual benefit for South Africa and EU firms in this sector. This paper assesses the barriers to, and potential opportunities for, private sector involvement in municipal water reuse PPPs for non-potable, industrial use.

### Legislative and regulatory context

South Africa has comprehensive legislation covering the water sector, municipal financial management and PPPs. While national government is responsible for water resources, municipalities have the responsibility for water services provision. Municipalities are required to follow strict procedures if they are changing the mode of service delivery from an internal to external mechanism, or when entering into a PPP. The Municipal Financial Management Act (MFMA) PPP Regulations prescribe a strict process, with the views and recommendations of National Treasury required at four different stages. A transaction between a private party and a municipality is defined in the regulations as a PPP if it satisfies three conditions, relating to: 1) the performance of a municipal function or use of municipal land; 2) the transfer of risk; and 3) the receipt of monetary benefit. Importantly, the provision of non-potable water is not a municipal service, and therefore water reuse for non-potable purposes does not satisfy the first precondition of a PPP. However, the two cases where water reuse would likely be considered a PPP are where a water reuse plant is involved in the treatment of wastewater (which is a municipal service) or where the reuse plant is located on municipal property.

### Barriers to water reuse PPPs

#### *Regulatory barriers*

Legislation governing PPPs and municipal services in South Africa is complex. Municipal officials perceive PPPs as being too onerous and time consuming, thus preferring not to conceptualise or package projects as PPPs, opting for internally-funded or grant-funded projects instead. The regulations, which do not differentiate by project size, result in extended procurement processes, pushing up transaction costs which can make projects unviable. The MFMA Supply Chain Management Regulations also pose potential barriers to effective PPPs. Regulations around unsolicited bids may discourage technological innovation. Foreign firms

need to be aware of the implications of the Broad-Based Black Economic Empowerment for competitiveness.

The lack of clarity in the National Water Act around whether treated wastewater is classified as 'waste' or a 'water resource' creates uncertainty about licensing requirements and thus a regulatory risk. There is also a lack of legislative clarity around the rights of downstream users to wastewater effluent flows in rivers, which affects inland municipalities more than coastal ones.

#### *Capacity barriers*

Local government has a critical shortage of technical staff to package projects, draft adequate Terms of References for projects, evaluate proposals, and monitor the contracts once they are in place. Additionally, municipalities experience relatively high staff turnover, which breaks institutional memory and existing relationships. Financial management and governance in many municipalities is also weak, reflected in poor audit results. Capacity constraints also exist at national and provincial spheres amongst those entities tasked with supporting and regulating municipal PPPs.

#### *Financial barriers*

There is substantial interest from DFIs and commercial banks in investing in municipal infrastructure projects and a number of public-private infrastructure funding programmes exist. However, the non-payment for services by customers, and the subsequent defaulting risk by the municipality is high. Water supply to poor, non-paying customers is often heavily cross-subsidised by paying customers, including large industrial customers. This creates a disincentive for municipalities to want to lose industrial customers through a reuse PPP unless the resource is severely constrained, or some financial compensation is provided. One of the notable financial barriers to water reuse PPPs is the low price of potable water in South Africa, which puts pressure on the financial viability of reuse projects.

#### *Technical barriers*

A technical barrier to the viability of reuse PPPs is the variable quality and quantity of municipal wastewater effluent, which cannot be guaranteed by municipalities. The location of industrial water demand in relation to municipal wastewater treatment works is also a potential constraint.

### **Potential measures to address barriers to water reuse PPPs**

The PPP regulations are currently being reviewed by National Treasury to speed up the process and reduce the administrative burden. The revisions could include provisions that are more context specific and that cater to their varying needs. Legislative clarity on downstream water users to treated effluent flows and the status of treated effluent as a 'resource', is required.

Additionally, DBSA and DWS is proposing to establish a municipal water reuse project office which will be housed within national government. Should this not materialise, alternative capacity building programmes are needed to support the packaging of projects through PPPs.

The mapping of large industrial water users in relation to municipal wastewater treatment works should be considered, in order to be able to identify the most promising geographic areas for PPP projects.

The Infrastructure Investment Programme for South Africa (IIPSA) is currently available as a grant for project preparation, a grant for technical assistance, a direct grant for project implementation, interest rate subsidy or a loan guarantee cost finance or insurance premium cover. However, this facility ends in 2020. Additional support for project preparation and transaction advice, such as those provided by the IFC on a reimbursable grant model, should be considered. The DBSA is also designing a financing instrument to lower the cost of capital to private parties to PPPs.

The problem of loss of municipal revenue as a result of water reuse can be addressed through contract provisions for the private party to compensate the municipality for loss of revenue, where this is possible. The issue of low water tariffs has both a short-term and a long-term potential solutions. The short-term solutions are to focus PPP efforts in water-stressed municipalities with relatively high industrial water tariffs to increase the attractiveness of reuse. The longer-term solution is to promote cost-reflective tariffs in municipalities.

## **Potential role for European businesses**

### *As financiers*

The IIPSA-funded programme has opened the opportunity for European DFI funding into the reuse finance facility. This opportunity is focussed on funding for credit enhancement and not the senior loan, as there is evidence that there is sufficient capital in the local market to fund projects. A further opportunity would be to partner with the IFC to fund their reimbursable grant model for transaction advice.

### *As technical advisors*

Given that the PPP regulations require the appointment of a transaction advisor, every PPP will present opportunities for experienced individuals and firms in providing transaction advice. The greater experience of EU firms and professionals relative to South African counterparts provide some advantage in these appointments.

### *As PPP partners*

European firms are already present in South Africa and bidding for reuse projects in the country and the region. European firms have the expertise technology to improve quality of wastewater treatment and have established a niche in the market. The transfer of these skills to South African operators and managers would be a great benefit to the sector.

### *As technical suppliers*

The water reuse project office proposed by the DBSA will able EU firms to showcase technology, influence project specification, and potentially be pre-approved as potential service providers to municipalities. The country is already heavily dependent on imported technology, but the EU is under-represented in the market.



# 1 Introduction

---

## 1.1 Project background

The European Union-South Africa (EU-SA) Partners for Growth Programme supports the European Union (EU) Delegation in its efforts to maximise bilateral trade and investment flows between the European Union and South Africa. The concept of a circular economy has become mainstreamed in many countries globally, including the EU and China, but has not reached legislated status in South Africa. South Africa is moving towards this, and has numerous dialogues on the topic, albeit with a focus on the waste sector only at this stage. The Circular Economy component of the EU-SA Partners for Growth Programme has chosen to focus on water reuse PPPs specifically because of the projected water shortages and the policies of the South African government to encourage private sector involvement in resolving the current water crisis, including in overarching national plan, the National Development Plan 2030 (National Planning Commission, 2013), National Water Investment Framework and National Water and Sanitation Masterplan (Department of Water and Sanitation, 2018). The programme believes there is scope for mutual benefit for South Africa and EU firms in this sector.

Recent droughts have brought attention to the water sector. There are circular economy opportunities in this sector, as natural resources escape in the form of either water, energy or materials. Water reuse has potentially significant environmental benefits, and there are also significant opportunities for private sector involvement. This paper assesses the scope for private sector involvement (in particular, through PPP's) in municipal water reuse for non-potable, industrial use. This specifically excludes Direct Potable Reuse (DPR) schemes and other water and wastewater value-chains, such as desalination, wastewater treatment<sup>1</sup> and non-revenue water.

## 1.2 Water resource situation

South Africa is a water-stressed country and has limited water resources available and it is well established that South Africa is on an unsustainable water consumption path. The National Water and Sanitation Master Plan (Department of Water and Sanitation, 2018) states that South Africa will require 17% more water in 2030 than is currently available. The implication of this is that alternative water sources will need to be identified. The impact of urban water shortages on the economy are potentially severe. The importance of this has been reinforced by the near-catastrophic drought in the City of Cape Town, which, prior to the drought, relied almost exclusively on surface water.

National Government has recognised the need for demand-side and supply-side measures to alleviate the strain on the water resources. On the demand side, there is an increased focus on water conservation and demand management, as the average consumption in South Africa is 237 litres per capita per day, compared to a global average of 173 litres per capita per day.

---

<sup>1</sup> The reuse of water may include wastewater treatment, depending on the project. This is an important factor that will be discussed further later in the report.

There is also a national average non-revenue water of 41% (with technical losses of 35%), resulting in losses of approximately 1 660 million kilolitres per year, representing an annual wasted expenditure of approximately R9.9 billion (approximately €610 million) (Department of Water and Sanitation, 2018).

On the supply side, there is also a need for alternative water sources to supply projected growths in demand. The historical and projected water availability mix is shown below.

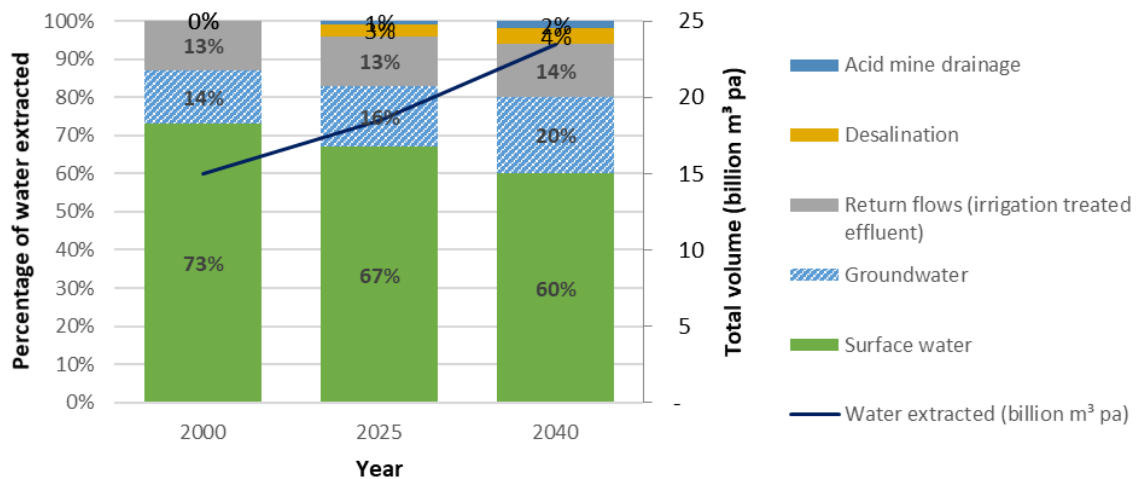


Figure 1: Historical and proposed water availability mix (Department of Water and Sanitation, 2018).

Figure 1 shows the decreasing reliance on surface water, with increases from groundwater, return flows (from municipal wastewater and acid mine drainage) and desalination. Overall demand for water is expected to grow at approximately 1.6% per annum between 2025 and 2040. The demand makeup for water in South Africa is shown in Figure 2.

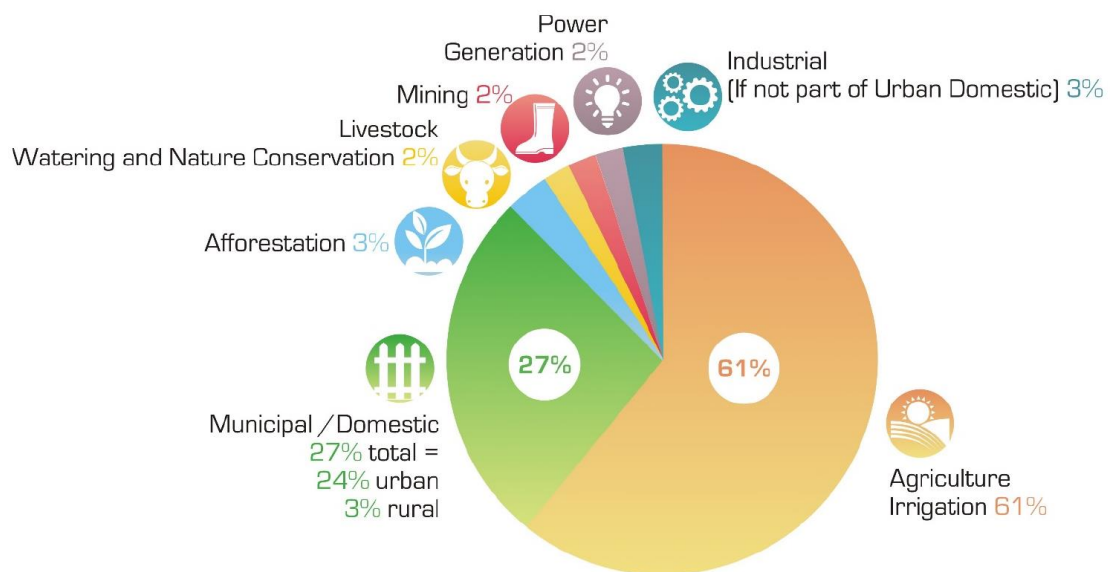


Figure 2: Water use by sector in 2018 (Source: Department of Water and Sanitation, 2018)

### 1.3 Institutional context for water provision

The Constitution and the National Water Act, 1998, allocates the management of water resources to National Government, specifically the Department of Water and Sanitation (DWS) and the management of water and sanitation services for all citizens to municipalities (local government, through the Water Services Act, 1997).

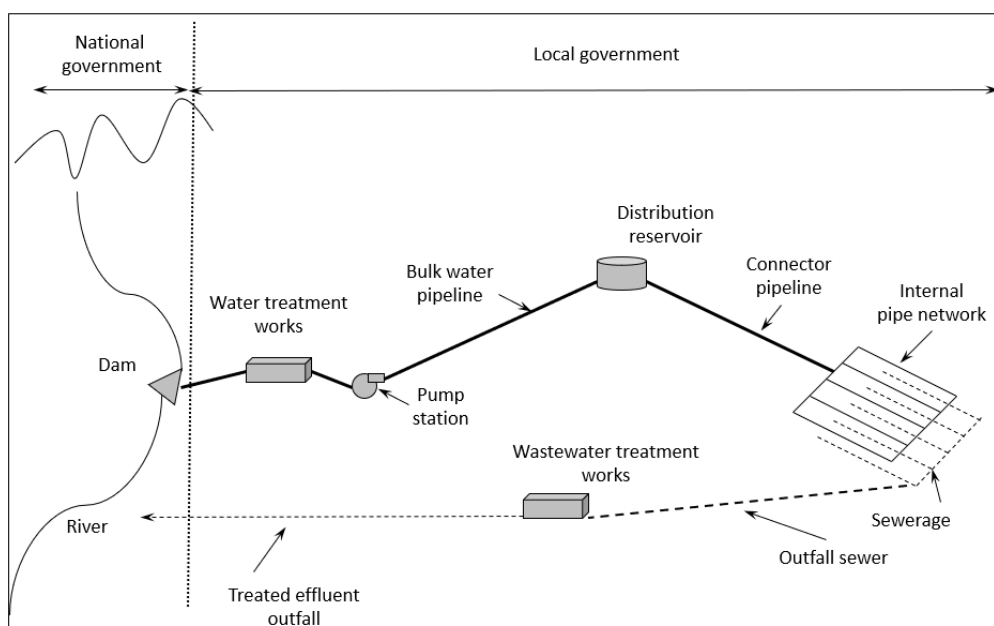


Figure 3: Institutional and functional arrangements for water and wastewater (Source: Adapted from DBSA, 2009)

Figure 3 shows the institutional and functional arrangements for the water and wastewater service provision. In some circumstances there may be other entities involved, such as water boards and catchment management agencies. For the purposes of this paper, the important water services institutions are described briefly below:

#### Water boards

A water board is a public entity, reporting to DWS, responsible primarily for providing bulk water to some municipalities. Some water boards also provide bulk wastewater services, and, in a few instances, water retail services. Water boards are also entitled to supply non-potable water directly to end users. There are nine water boards in South Africa, of which Rand Water, which services Gauteng and surrounding provinces, is the largest.

#### Water Service Authorities

The Water Service Authority (WSA) is the sphere of local government responsible for water service provision, including industrial water use, and can be the local or district municipality<sup>2</sup>. There are 22 district municipalities and 122 local municipalities (including the 8 metropolitan

<sup>2</sup> South Africa has a two-tier local government system, with non-metro local municipalities falling within a district municipality. Local and district municipalities have distinct responsibilities which can vary across the country.

municipalities) that are WSAs. The WSA can also be the Water Service Provider (WSP) or may contract out this function to a public or private entity.

### Water service providers (WSP)

The WSP is the entity that actually provides the service, under contract to the WSA. This contract can cover the whole service, a part of the service (such as bulk water provision), or a particular geographic area within a municipality.

## 1.4 Water services financing

Municipalities in South Africa are empowered to charge user tariffs for water services. However, because of the high levels of poverty, poor households are heavily subsidised, either through national grants (a conditional capital grant for infrastructure serving the poor and an unconditional operational grant to provide basic services to the poor) or through internal cross-subsidies within the service. Capital finance for the funding of infrastructure to non-poor and non-residential customers should be funded from tariff revenue, via the municipalities’ own reserves, debt, or an off-balance sheet instrument, such as a PPP.

However, many municipalities in South African are struggling financially, with 40 municipalities having negative cash balances at the end of the 2018 financial year (National Treasury, 2019). A contributor to poor municipal financial viability is the inability of municipalities to recover billed revenue. Figure 4 below shows the debt outstanding to municipalities.

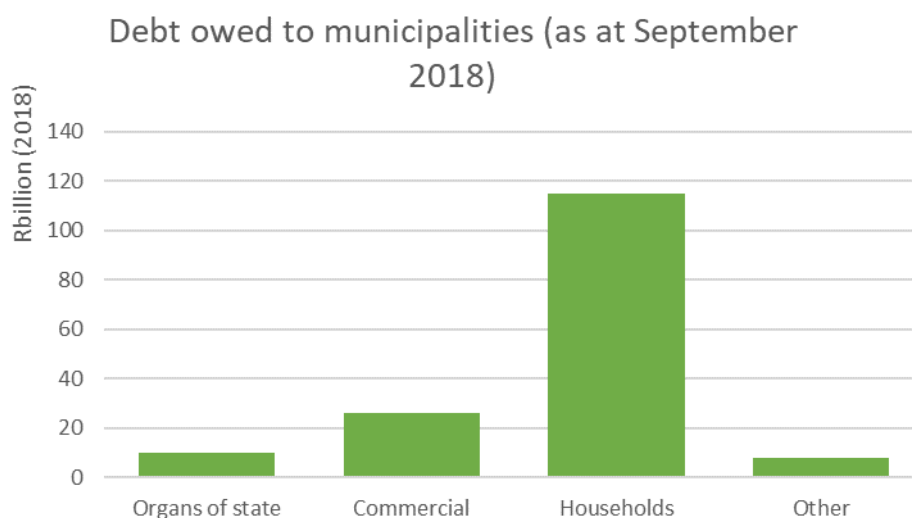


Figure 4: Outstanding debt owed to municipalities by source (Source: National Treasury, MFMA Section 71 reports for Q1 2018/19)

There is an annual funding gap of R33 billion (€2 billion) for water and sanitation infrastructure over the next 10 years that will be required to provide the required infrastructure (Department of Water and Sanitation, 2018). This is particularly important when considering the R28 billion (€1.7 billion) decrease in conditional capital infrastructure grants that were announced in the 2018/19 budget, so municipalities need to look elsewhere to source capital finance. As South Africa’s guiding planning document, the National Development Plan (NDP) 2030 identified that government must “urgently address constraints to public-private

partnerships – including the institutional arrangements for regulating and executing such partnerships as well as relevant capacity in government departments and spheres” (National Planning Commission, 2012:155).

### 1.5 Market for water reuse in South Africa

The need for water reuse in South Africa is widely acknowledged throughout national policy and position papers (see the National Water Resource Strategy, Water Reconciliation Studies, National Development Plan and the Water and Sanitation Master Plan). Although it is not possible to ascertain an exact figure for reuse potential, it is estimated that the industrial use of water (including power generation) accounts for approximately 5% of total water demand, or 750 million m<sup>3</sup> annually. Although this is a relatively small proportion, this represents almost 16% of total municipal water demand (Department of Water and Sanitation, 2018). National government encourages investment from the private sector, predominately through Build-Operate-Transfer (BOT) and Build-Own-Operate-Transfer (BOOT) models, into the water sector to close the funding gap (National Treasury, 2019).

The reconciliation strategy for the industrial, mining and power generation (IMP) sectors indicates the wastewater reuse can contribute up to 14.3% of the IMP sector water demand as part of its water mix for internal purposes (Reddy & Siqalaba, 2018). Rough calculations imply that the demand for non-potable water is approximately 107 million m<sup>3</sup> per annum. Wastewater treatment works in the country produce approximately 2 100 million m<sup>3</sup> per annum, so there is ample supply, although there are many other factors that must be aligned before water reuse projects can be implemented.

Many municipalities throughout South Africa, and particularly the larger municipalities, already distribute treated effluent from wastewater treatment works for non-potable uses. These uses are usually for irrigation (schools and golf courses) but do also include industrial uses, mainly cooling. However, the scale of this wastewater reuse is limited to the investment that the municipality or the user is willing to make in a distribution network. For example, the City of Cape Town currently sells approximately 75 Ml of wastewater per day, compared to the 450 Ml treated per day (16%). Saldanha Bay municipality, which has a high number of heavy industrial users, only sells 6% of treated wastewater effluent, despite reporting a demand well in excess of this figure. A further reason for the lack of uptake is that municipalities are not able to guarantee consistent quality or quantity of wastewater.

The prime example of a municipal PPP for water reuse is the water reclamation plant in eThekweni, which is a partnership between Durban Water Recycling Project (Pty) Ltd, majority-owned by European firm, Veolia, and eThekweni Metropolitan Municipality (Durban). This project was implemented in 1999 prior to the introduction of the governing legislation in South Africa (see Box 7). This is also the case for other notable PPPs in the water sector, namely the iLembe concession and the Mbombela concession.

There have also been water reuse initiatives by businesses themselves, reusing their own effluent. In a survey by GreenCape<sup>3</sup>, 66% of 58 businesses surveyed in the Western Cape had

---

<sup>3</sup> GreenCape is a non-profit organisation that works at the interface of business, government and academia to identify and remove barriers to economically viable green economy infrastructure solutions.

invested in onsite water reuse technology. These are largely low-cost interventions with a relatively short payback period. However, there is limited appetite by industries to treat and reuse the effluent onsite due to the cost, the time it takes to get these projects online and the technical complexities (GreenCape, 2019).

## 2 Legislative and policy context for water reuse PPPs

---

### 2.1 Legislative context

In addition to the water-related legislation mentioned above, the most relevant legislation for water reuse PPPs includes:

- The **National Water Act, 1998** (NWA), which governs the use of water resources and defines institutional responsibilities;
- The **Local Government: Municipal Systems Act, 2000** (MSA) which governs the provision of municipal services;
- The **Local Government: Municipal Finance Management Act, 2003** (MFMA) which governs local government finances, including:
  - the MFMA **PPP Regulations, 2005**, which outline the process for implementing municipal PPPs; and
  - the MFMA **Municipal Supply Chain Management Regulations, 2005**; and
- The **Preferential Procurement Policy Framework Act, 2000** which governs municipal procurement and is supported by
  - The PPPFA **Preferential Procurement Regulations, 2017**.

#### 2.1.1 National Water Act (NWA)

The NWA defines lawful water uses and the uses for which licenses are required. Water use licenses are issued by the DWS and are required for a range of activities, including storing water, impeding or diverting the flow in a river, irrigation of land with waste or water containing waste generated through any industrial activity or by a water work. A 'water resource' is defined as being one that: "*includes a watercourse, surface water, estuary or aquifer*". The NWA does not list the reuse of wastewater effluent as a lawful or generally authorised water use and is otherwise silent on the matter.

#### 2.1.2 Municipal Systems Act (MSA)

Chapter 8 of the MSA governs municipal services and should be followed if the public-private partnership concerns a municipal service. Sections 76-78 are intended to ensure that municipalities select the most appropriate mechanism for the delivery of municipal service. The mechanisms can be internal (by the municipality itself) or external (anybody else). If external, as would be the case if a municipal service was provided through a PPP, then a prescribed process (described in Section 78) must be followed before a municipal council approves such a transaction.

### 2.1.3 Municipal Finance Management Act (MFMA)

The following sections of the MFMA are important when considering PPPs:

#### *Section 120 - Conditions and process for public-private partnerships*

The municipality must demonstrate that any PPP being entered into by a municipality will (1) provide value for money to the municipality, (2) be affordable to the municipality, (3) transfer appropriate technical, operational and financial risk to the private party. Section 120 also contains the details of what must be covered in a feasibility study for the PPP, and the process that must be followed to ensure that the community is aware that a PPP is being contemplated by the municipality. Additionally, the views and recommendations of the National Treasury, the national department responsible for local government, the line department (for example, DWS) and any other relevant organ of state must be sought in the process.

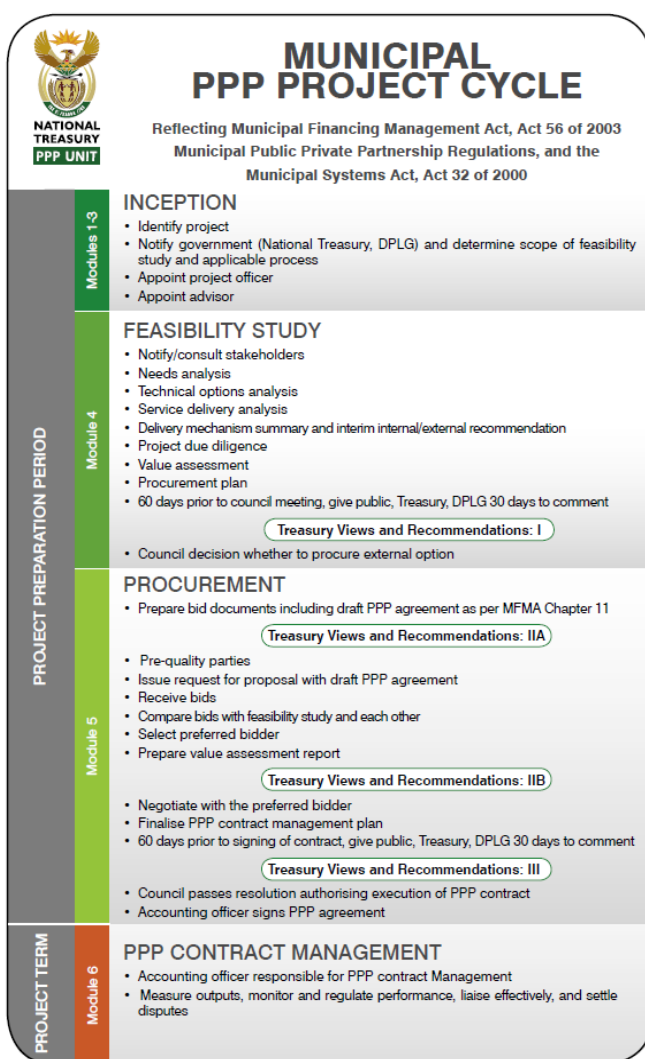


Figure 5: Municipal PPP Project Cycle (Source: National Treasury, 2007)

(feasibility study, procurement, value for money and final PPP agreement). It is compulsory that these views are considered when deciding on whether to pursue the PPP.

#### *Section 33 – Council approval for multi-year commitment*

The municipal manager needs to have secured public participation, council approval and endorsement by the National Treasury for contracts having more than a three-year implication on the municipality’s finances. Council must consider the financial obligations for each year of the proposed contract, the impact these will have, comments received on the proposed contract as well as the views of the National Treasury and relevant provincial treasuries, the Department of Cooperative Governance and national department for responsible for the service, if applicable.

#### *PPP regulations*

The PPP regulations are broken into four phases and six different modules (Figure 5). They are designed to assist municipalities in the process of initiating a PPP. There are also four stages at which the views and recommendations of National Treasury must be sought

Given that the prescribed PPP process is prescriptive and complex, the National Treasury issued the Municipal Service Delivery and PPP Guidelines in 2007 to assist municipalities in navigating the PPP regulations.

#### *Supply Chain Management (SCM) regulations*

The SCM processes in South Africa are highly prescriptive and tightly regulated to combat fraud and corruption and ensure effective and efficient use of public resources. Municipalities may consider unsolicited bids for all good and services (including PPPs), although this must be done under a prescribed framework. A municipality is under no obligation to consider an unsolicited bid, but may accept an unsolicited bid if;

- The product or service offered in terms of the bid is a demonstrably or proven unique innovative concept;
- The product or service will be exceptionally beneficial to, or have exceptional cost advantages for, the municipality or municipal entity;
- The person who made the bid is the sole provider of the product or service; and
- The reasons for not going through the normal bidding processes are found to be sound by the municipal manager.

The municipality must also notify the public that it is considering an unsolicited bid and submit to provincial and national treasuries for their comment and recommendations.

#### 2.1.4 Preferential Procurement Policy Framework Act (PPPFA)

A point-based system is in place for the adjudication of tenders. Tenders are adjudicated based on their technical compliance, broad-based black economic empowerment (B-BBEE) status<sup>4</sup> and cost to the municipality. For contracts over R50 million (€3 million), once tenderers have overcome a technical compliance threshold, tenders are given 90% of points for price and 10% of points for B-BBEE status. For contracts under R50 million, the points split is 80/20. The B-BBEE policy is applied at two points in the PPP cycle; for the procurement of a transaction advisor and the selection of the private partner. The PPPFA Regulations also allow a municipality to apply pre-qualifying criteria relating to minimum B-BBEE status level, company size or ownership by black people<sup>5</sup>. Other conditions to tender may be added in terms of local content and sub-contracting requirements.

## 2.2 Policy context

The National Treasury (2019) acknowledges that the public sector cannot fund the infrastructure backlog alone. The National Water and Sanitation Master Plan (Department of Water and Sanitation, 2018) recognizes the complex policy and legislative context that water services are operating in, that there is a shortage of public sector capital for investment in

---

<sup>4</sup> Separate legislation, the Broad-Based Black Economic Empowerment Act, 2003 describes this status and its qualification requirements.

<sup>5</sup> As defined in the B-BBEE Act, 2003.



water infrastructure, and that there is a need to crowd in private sector finance. This sets the general financing context for the water and sanitation sector.

The Department of Water Affairs (now DWS) released the second version of the National Water Resource Strategy (NWRSSII) in 2013, which recognises that the potential for development of additional conventional surface water resources is limited and that other resource options need to be implemented. The subsequent National Strategy for Water Reuse (2013) provides the rationale for, and proposed approach to, water reuse.

Although there is widespread support for water reuse, there are important discussions about the environmental, social and health safeguards that need to be implemented in order to ensure that the potential negative externalities of water reuse are both understood and mitigated against if necessary. The majority of these policies, regulations and standards relate to the health aspects of water for potable uses.

### 2.3 South African definition of a PPP

The MFMA PPP Regulations defines a PPP as:

“...a commercial transaction between a municipality and a private party in terms of which the private party-

- a) Performs a municipal function<sup>6</sup> for or on behalf of a municipality, or acquires the management or use of municipal property for its own commercial purposes, or both performs a municipal function for or on behalf of a municipality and acquires the management or use of municipal property for its own commercial purposes; and
- b) Assumes substantial financial, technical and operational risks in connection with –
  - i. The performance of the municipal function;
  - ii. The management or use of the municipal property; or
  - iii. Both, and
- c) Receives a benefit from performing the municipal function or from utilising the municipal property or from both, by way of –
  - i. Consideration to be paid or given by the municipality or a municipal entity under the sole or shared control of the municipality;
  - ii. Charges or fees to be collected by the private party from users or customers of a service provided to them; or
  - iii. A combination of the benefits referred to in subparagraphs (i) and (ii)”

While the above definition is fairly broad, it is important to note that the definition requires a contract to satisfy *all three* criteria ((a), (b) and (c)) to qualify as a PPP. If one criterion is not satisfied, the contract is not a PPP. Operating contracts, whereby a private company uses

---

<sup>6</sup> A municipal function is defined in the PPP Regulations as “a municipal service, or any other activity within legal competence of a municipality”

municipal assets to treat municipal wastewater for a fixed monthly, or volume-based fee do not generally satisfy the risk criteria and would not be considered a PPP.

Given the above definition, a key policy question is: Is wastewater reuse for industrial use a municipal service? The MSA defines ‘a municipal service’ as “...a service that a municipality in terms of its powers and functions provides or may provide to or for the benefit of the local community...”. Powers and functions of municipalities are defined in Part B of Schedule 4 and Part B of Schedule 5 of the South African Constitution and include: “Water and sanitation services limited to potable water supply systems and domestic waste-water and sewage disposal systems”

Importantly, the provision of non-potable water is not a municipal service, and therefore water reuse for non-potable purposes does not satisfy that specific precondition of a PPP. However, there are two cases where water reuse would likely be considered a PPP:

1. Where a water reuse plant is involved in the treatment of wastewater (which is a municipal service) or
2. Where the reuse plant is located on municipal property.

By implication, if the water reuse plant on a private property takes fully treated effluent from a municipal wastewater treatment works and further treats it for non-potable use, it would not be defined as a PPP.

## 3 Barriers to water reuse PPPs

---

### 3.1 Regulatory barriers

The legislation governing PPP’s and municipal services in South Africa is rigid and complex but is also well-defined and sets out clearly the steps that need to be followed in order to enact a PPP. While not necessarily presenting a barrier, some private and public parties have stated that they are unnecessarily complex and fastidious (see National Business Initiative, 2019; Castalia Strategic Advisors, 2007) and has been cited as the main reason for the poor uptake of municipal PPPs. The PPP regulations have tended to have two effects. Firstly, the process is perceived by municipal officials as being too onerous to contemplate, with the result that projects are never conceptualised or packaged as PPPs. Municipalities avoid PPPs and choose to fund projects through grants or own funds (where possible) or simply do not invest in the required infrastructure. Secondly, the process takes a significant amount of time. An organisation representing business states that these regulations can take between three and six years to navigate (National Business Initiative, 2019). This timeframe is likely to overlap with political and organisational change, and therefore there is a high propensity for these deals to fail.

The PPP regulations also require that the same process is followed for any municipal PPP, regardless of size. The financial and time cost of this process is a very high proportion of the cost of smaller projects. A proposed threshold figure of R300 million (€18.5 million) has been given (Reddy & Siquelaba, 2018) for the minimum size of a project to justify the transaction costs. This means that only relatively large reuse projects would qualify, which by implication

means that only municipalities with large wastewater volumes and industrial consumers would be eligible for water reuse PPPs.

The time implications of the combination of the PPP Regulatory process, and the MSA Section 78 process relating to the external provision of a municipal service, mean that municipal and private parties attempt to package the projects in a way that avoids the regulatory triggers. This can result in a sub-optimal technical and financial solution. It can be risky, as the impact of not following a regulatory step that was thought not to be required, but later determined to apply, could cause a project to fail (see Box 1). The grey area around what qualifies as a PPP or as a municipal service causes much uncertainty in the sector.

**Box 1: Proposed waste PPP in Drakenstein**

In 2008, Drakenstein Local Municipality embarked on a process to resolve its waste disposal challenges through the creation of a waste to energy plant. The municipality undertook a Municipal Systems Act Section 78 study in 2013 that indicated that the waste to energy plant is feasible if it is delivered through a PPP. The municipality, however, did not accurately follow due process as set out in the PPP Regulation, and therefore the project was cancelled on the instruction of National Treasury in May 2018 – ten years after the process was initiated.

While municipalities have expressed reluctance to enter into long-term contracts because of the onerous requirements of Section 33 of the MFMA, other municipalities that have successfully complied with this clause emphasise that the process is fairly easy to manage and should not discourage municipalities from these types of contracts. The view from National Treasury is that these contracts can be more beneficial to the municipality and the private party, but municipalities are hesitant to commit to these as they are afraid of National Treasury's opinion.

The MFMA Supply Chain Management Regulations pose two potential barriers to foreign firms becoming involved in water reuse PPPs. Firstly, the regulations impose special conditions that must be met if municipalities wish to consider unsolicited bids. In the context of water reuse PPPs, unsolicited bids can be a useful way of introducing innovative technology into a market. Without this option, municipalities would need to be able to specify calls for proposal in such a way that would permit, or promote, alternative technologies. Secondly, although they are necessary to ensure that fair processes are followed, the regulations mean that the procurement process takes a long time to be concluded, particularly for large and complex transactions, thereby pushing up the transaction costs.

The PPPFA regulations relating to B-BBEE are an important consideration for foreign businesses, as the B-BBEE policy is applicable regardless of the origin of the private party. This means that any foreign-owned company will have a handicap of up to 10% of tender points if tendering against a local company with a B-BBEE status level. Many companies enter into arrangements with South African partners in order to both transfer skills and knowledge, in line with the principles underlying B-BBEE in South Africa, and to ensure that the bid is competitive. The PPPFA does allow municipalities to award a contract to a tenderer that did

not score the highest points, but only according to objective criteria specified in the tender documents. This provision is seldom, if ever, applied.

The NWA takes a linear approach to water use: from resource, to treatment, to use, to treatment, to discharge. The idea of a circular economy is not incorporated into the NWA, and therefore there is a lack of clarity around whether treated effluent is classified as ‘waste’ or a ‘resource’, requiring a license. One interpretation of the provisions of the NWA is that water reuse projects do not require water use licenses. None of the water reuse cases that have been investigated for this paper have required licenses. However, it is highly possible that licences will be required for certain projects. These licenses face their own bureaucratic challenges and have been reported to take a long time to acquire. Despite a commitment by DWS to adjudicate applications within 300 days, it often takes longer. The lack of clarity around the requirement and the large potential delays to reuse PPPs adds substantial risk.

An issue that has arisen in more than one municipality investigating wastewater reuse is the rights of downstream users to wastewater effluent flows in rivers. This has mainly been raised by farmers in relation to irrigation water but is also a consideration for ensuring the minimum flow for environmental functions (‘ecological reserve’). While South African legislation clearly regulates the ecological reserve, it is silent on the rights of downstream users to wastewater effluent. This issue is likely to affect most inland municipalities, many of whom discharge into long river systems. Until the legal uncertainty is resolved, it is more prudent for wastewater PPPs to be initiated in coastal municipalities where the issue does not exist.

## 3.2 Capacity barriers

### 3.2.1 Municipal capacity

In 2017 there were 294 professional engineers in local government nationally (down from 455 in 2007), which is approximately half of the number required to adequately plan, deliver, operate and maintain services, including water services (Lawless 2017). The average age of all qualified civil engineering staff (including technicians and technologists) per municipality is 38, down from 46 in 2007, which indicates that the workforce is relatively inexperienced and underqualified. Qualified staff are concentrated in the eight metropolitan municipalities, who together have approximately half of the civil engineering staff (Lawless 2017). South Africa has relatively stringent requirements for the number and qualification of staff operating wastewater treatment works, which many municipalities fail to satisfy (see Box 2).

#### Box 2: Proposed wastewater PPPs in eThekweni

eThekweni Municipality (Durban) is in the process of undertaking feasibility studies for three new wastewater treatment works. There is a current proposal to structure these as PPPs and to include a reuse component – either for industrial use or as direct potable reuse. The reason that the municipality is investigating a PPP option is because the municipality’s water department acknowledges that it does not have the technical capacity to operate the plants such that the required standards of wastewater treatment at three additional plants are met.

The lack of technical capacity is evidenced in poor performance in municipal wastewater treatment. Data indicates that 259 out of 836 (31%) municipal wastewater treatment works have been assigned a high-risk of failure rating, and 212 out of 836 (26%) assigned a critical risk rating. The indications are that 57% of the water treatment plants in the country (treating approximately 1 300 million m<sup>3</sup>/annum) require urgent intervention (Reddy & Siquilaba, 2018).

There is a perception amongst interviewees that municipal officials lack the skills required to package projects, draft adequate Terms of References for projects, evaluate proposals, and monitor the contracts once they are in place. This opinion was reinforced by the National Business Initiative, who undertook a study in 2019 to investigate the opportunities and challenges for water and wastewater PPPs. Some of the interviewees believed that the municipal employees have adequate skills, but inadequate time to undertake a prescribed PPP process. Additionally, municipalities experience relatively high staff turnover, which breaks institutional memory and existing relationships.

Regarding the financial and administrative capacity of municipalities, only 8% of municipalities in the country received a clean audit result. Obtaining clean audits is a measure of compliance with national laws and regulations, and is not necessarily a measure of technical capacity, but it does indicate that there are challenges in many municipalities. The World Bank, through their involvement in infrastructure finance in South Africa, have identified that technical and financial capacity in municipalities is weak, and is one of the main inhibitors to private sector investments in infrastructure in these municipalities. There is evidence that suggests that contract management in municipalities is poor (see Box 3), which disincentivises private parties from investing, as this poor contract management may materially affect their investment case (National Business Initiative, 2019).

**Box 3: Mbombela concession contract management**

A 30-year concession contract for water and sanitation services was entered into between, what was then the Nelspruit Transitional Local Council and the Greater Nelspruit Utility Company, substantially owned by a UK-based company, Biwater, in 1999. The municipality set up a contract management unit that is responsible for overseeing the performance of the concessionaire.

A recent review of the contract found that the performance of the municipality in managing the contract has been poor and that the capacity of internal contract management unit is inadequate. For instance, the contract unit from the municipality only met with the concessionaire twice in 2018, when there should be monthly meetings. In addition, there was no reporting on concessionaire performance to the Council.

**3.2.2 National capacity**

Two main functions are performed by national government in relation to municipal PPPs. The policy and regulatory function, which includes providing views and recommendations on municipal PPPs, is performed by a unit within the National Treasury. The technical support function is performed by a different unit with the National Treasury, located within the Government Technical and Advisory Centre (GTAC). The GTAC PPP unit, initiated in 2004, assists municipalities with the implementation of PPPs. There are less than ten people in this unit, which they feel is insufficient to adequately perform their work. However, Castalia

Strategic Advisors (2007) also found that that there were unnecessary levels of supervision by the PPP Unit. There are also capacity constraints in the provincial treasuries and the sector departments that are meant to be assisting and advising municipalities in the PPP process.

### 3.2.3 Private sector capacity

The PPP regulations require a transaction advisor to be appointed in order to implement a PPP. The interviews conducted as part of this research indicated that South Africa has competent transactions advisors operating in the private sector. The transaction advisors that are procured to assist the municipality have experience across a range of sectors, yet due to the relatively small number of PPP's in water and sanitation, there is relatively little experience in this particular sector. Interviewees stated that this was not necessarily a hinderance, as the experience in other sectors is deep and growing, particularly in the energy sector through the Renewable Energy Independent Power Producers PPP process.

## 3.3 Political barriers

The individuals that were interviewed for this paper provided mixed opinions on whether or not municipal councils are supportive of PPPs. Some indicated that political turnover will derail a project, and others were of the opinion that the municipal council will support service delivery, regardless of whether the project is through a PPP or through an internal mechanism. In particular, if the project could not have been implemented through an internal mechanism (for example, due to a lack of funding) then politicians would more easily accept service delivery through a PPP. There is also local community resistance to the reuse of wastewater that needs to be addressed (Box 4).

### Box 4: Direct Potable Reuse in Beaufort West

Beaufort West is a town in the Great Karoo region with a population of 34 000 people. Being in an arid region, Beaufort West has no perennial rivers and is therefore heavily reliant on groundwater for water supply. In order to diversify the municipality's water sources and increase water resilience, the municipality entered into a 20-year performance-based BOT PPP concession agreement with a private company for Direct Potable Reuse of wastewater effluent. The municipality had to overcome convincing the community that the reclaimed water will be safe for consumption, and this was achieved through school tours through the plant, as well as multiple presentations and information sharing sessions (Marais, 2012). There were also religious concerns from the Muslim community on whether or not the water being consumed would not infringe on their beliefs. However this was settled through consulting legislation from Saudi Arabia (source of Islamic legislation) (Marais, 2012). Lastly, political buy in was necessary, and was attained through the principle of 'equal water for all' (Marais, 2012).

South Africa's democratic transition in 1994 resulted in a dominant ANC government in all spheres of government who had formed a tripartite alliance with the South African Communist Party and the Congress of South African Trade Unions. Municipalities are large employers with strong national municipal trade unions. The MSA Section 78 legislation was specifically designed to protect the interests of municipal employees, for whom PPPs may

mean job losses or re-employment by a private party under less favourable conditions (see Box 5). External service delivery mechanisms historically have been met with political resistance from municipal unions and other factions, although this anti-privatisation sentiment has declined in recent years. Interviewees indicated that this is more of a perceived threat by municipalities and their political leadership, and that there is not that much evidence of PPPs failing for this reason.

**Box 5: Long term contract in Overstrand Municipality**

In Overstrand Municipality, a 15-year service contract was signed with a private sector partner, Veolia, to operate and maintain bulk water services infrastructure. This contract was awarded in line with Section 33 of the MFMA (triggered due to the fact that the contract was longer than 3 years). Due to Section 33, the contract went out for comment from the public and organised labour. Labour appealed the contract due to potential loss of work, so these employees were taken over from the municipality by Veolia and the contestation was resolved.

### **3.4 Financial barriers**

While South Africa's fiscus is currently severely constrained, interviewees have suggested that there is sufficient capital in the private sector, both nationally and internationally, that is willing to enter into partnerships that are able to make a fair return and have some form of developmental impact. Local banks have complained that DFIs, and KfW in particular, have been crowding out the commercial financiers. However, there are some DFI-driven financial instruments that are available for the public sector that may lower the cost of capital, or the transaction costs, such as Infrastructure Investment Programme for South Africa (IIPSA) discussed in Section 4.

There are often concerns from private parties about their ability to recover tariff or other revenue from customers and/or the municipality. Again, due to the current economic climate, and for some historical and political reasons) payment for services by customers in some areas is low. There is also a significant proportion of municipalities that are in debt and which are unable to pay their creditors within the stipulated 30 days. This is a risk that private partners are often unwilling to take on municipal credit risk without some revenue assurances. However, if revenue is being generated from off-take agreements with industrial customers, then the risk of non-payment is low, although the financial viability of the industries concerned must also be considered (see Box 6).

**Box 6: Saldanha Bay industrial water use**

ArcelorMittal is a large steel fabricator in Saldanha Bay. During the drought of 2016-2018, the municipality approached ArcelorMittal to reduce their water consumption, and it was agreed that treated effluent could substitute potable water for some of the processes. The municipality and ArcelorMittal agreed to spend approximately €1 million to transport the treated effluent from the wastewater treatment works to the plant for use on the plant.

However, due to challenges in the local and global economy, the price of electricity and the drop in the price of steel, ArcelorMittal was struggling financially, and the company approached the municipality to reduce the price of the treated effluent. The municipality

agreed, as the company had helped them with the infrastructure investment when they had requested it. The company is currently paying a negligible amount for the treated effluent and will continue to do so for a defined amount of time. This arrangement was possible because of positive and a mutually beneficial relationship between the municipality and the company.

Water services in South Africa are heavily cross-subsidised internally, with large numbers of non-paying customers being subsidised by non-poor residential and non-residential customers. For this reason, municipalities have been reluctant to undertake project finance for specific infrastructure and ring-fencing the revenue from fee-paying customers to repay debt. The financial risk of industrial water reuse projects is that it will reduce the municipal revenue from the potable water sales it displaces, reducing the ability to cross-subsidise internally or between services. The Durban Water Recycling project provides a useful example of how this barrier was overcome (see Box 7). In this model, the private partner pays the municipality for the revenue that would have been recovered above the cost of water provision, as there was previously a cross-subsidisation from industrial to residential customers.

**Box 7: Durban Water Recycling**

In the 1990's Durban was facing sewerage capacity constraints, as the existing infrastructure could not cope with the growing population as well as economic development (World Bank Group, 2018). To address the sewage capacity problems, and to satisfy demand for lower-cost non-potable water from two large off-takers, eThekweni invited international tenders for a public-private partnership (PPP). The 20-year concession contract was awarded to the Veolia Water Systems consortium in 1999. The contract is a BOOT contract, valid until 2021 (World Bank Group, 2018), making it the first PPP of its kind in South Africa. The plant is designed to treat 48 million litres per day (10% of the municipality's wastewater) and required a total investment of R72 million (€4.5 million). This cost was covered by the equity from the consortium, and loans from Development Bank of Southern Africa (DBSA) and a private bank, Rand Merchant Bank (RMB). The water is sold to the two large off-takers – a paper mill and an oil refinery.

The consortium pays an annual management fee to the municipality, as well as an annual fee for the lease of the municipal land on which it is located. Importantly, the consortium also pays a fee to the municipality to account for lost cross-subsidisation opportunity from the industrial consumers. This payment was only possible because of the profitability of the scheme as a result of two large industrial off-takers with a long-term contract. However, the Durban project has still resulted in a net loss to the municipality, but is viewed by municipal officials as a success because of the freeing up of potable water and increase sewage treatment capacity to be able to service additional households and achieve the social objectives of the municipality.



Water tariffs in South Africa are generally accepted to be below the cost of providing water (National Business Initiative, 2019). Raw water tariffs are extremely low: 1.5-4.72c per m<sup>3</sup> for domestic and industry and 1.7c-2.81c per m<sup>3</sup> for irrigation (depending on the catchment)<sup>7</sup>. Water reuse is therefore not viable for agricultural purposes. Municipal water tariffs vary widely but are generally also low. Figure 6 shows 2017/18 industrial tariffs at different restriction levels for six municipalities in the Western Cape, indicating a normal (Level 1) tariff of between R10 and R20 per m<sup>3</sup>(€0.62 to €1.23). Industrial tariffs are generally lower than domestic or commercial tariffs. These prices indicate that water reuse will only be viable for industrial purposes if the cost is lower than the municipal tariff. However, the higher restriction tariffs indicate that water reuse will be more attractive in water stressed regions prone to restrictions. Water reuse also increases water security during drought restrictions but is still susceptible to reductions in wastewater volumes during times of drought.

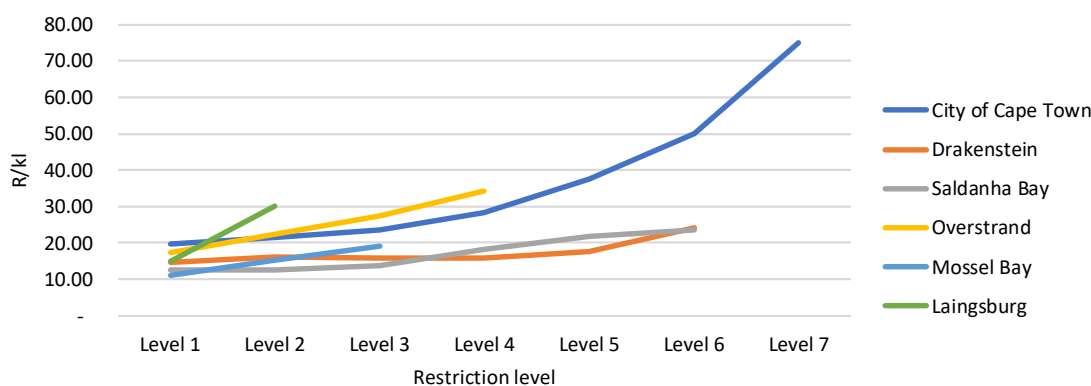


Figure 6: (Wet) Industrial tariffs (2017/18 excl. VAT) at various restriction levels<sup>8</sup>

### 3.5 Technical barriers

South Africa has access to world-class engineering and technical knowledge both domestically and internationally via global engineering firms with local offices. This includes knowledge of PPP contracts, access to technology (membranes, filters, pumps etc.) and financial knowledge. However, there is limited local experience in large-scale water reuse PPPs, particularly in the public sector. This lack of skills and experience can result in technical Terms of References that may not be appropriate for the particular contract or may be unnecessarily prescriptive.

A weakness of South African municipalities is long-term infrastructure planning and the implementation thereof. Municipalities are obliged to have masterplans in place for their technical services, but many municipalities do not have these, or they are inaccurate and/or out of date or not adhered to. This is important for projects that require significant lead time

<sup>7</sup> <http://niwis.dws.gov.za/niwis2/RWT>

<sup>8</sup> An assumed consumption of 2500kl/month has been used to divide basic charges into a per kl tariff. Level 7 is the equivalent of the City of Cape Town’s Level 6B.

to implement, as well as consultation with the broader community. Poor planning can lead to rushed solutions and contracting.

One of the current technical barriers to the upscaling of water reuse is the variability of the effluent quality. This is a function of both the variability in wastewater influent quality (which is often as a result of poor enforcement of regulations) and the poor management of wastewater treatment works. Nationally, it was found that 57% of South Africa's wastewater treatment plants are not well run, and frequently exceed their allowed effluent quality limits (Department of Water and Sanitation, 2018). If a private partner takes over the wastewater treatment function as part of the PPP, then this ceases to be a problem. However, if the private party is accepting treated municipal effluent, then additional treatment may be required (see Box 8).

**Box 8: Technical challenges in the Olifants River Catchment**

A private company in South Africa has a wastewater offtake agreement in the Olifants River catchment in Mpumalanga. The contract stipulates the quality parameters of the effluent, but the wastewater quality is often below the required standard. The private party is unwilling to impose the fines on the municipality that are stipulated in the contract, as it feels that this is unlikely to incentivise them to produce better quality water in the future. Instead, the private company has invested in additional treatment capacity for its own reuse plant to make allowances for the poor-quality effluent.

A significant factor which often impacts on the viability of non-potable water reuse projects is the proximity of wastewater treatment works (or proposed wastewater treatment works) to industry that could potentially take up the water. Where these locations are not viable for a municipal reuse scheme, businesses have created decentralised schemes. This is not a problem that is unique to South Africa.

## **4 Potential measures to address barriers to water reuse PPPs**

---

### **4.1 Regulatory**

The time required to complete the prescribed PPP process, and the burden of this process perceived by officials, are probably the most significant barriers to upscaling water reuse PPPs on South Africa. The National Treasury is aware of this and is undergoing a process to revisit the PPP regulations, which will be complete by October 2020. Guidance is being taken from international experiences with PPPs. The following initiatives are being considered (National Treasury, 2019):

- Merging some of the approval requirements;
- Developing a framework for 'soft' PPPs (these projects relate to the provision of "soft" infrastructure facilities and related non-core services);
- Different processes for large and small PPPs;

- Introducing partnerships that will allow public entities to work with other public-sector organisations on infrastructure projects;
- Reviewing the PPP legislative framework; and
- Putting in place mechanisms to address the affordability gap in PPPs.

Municipal officials stated that having a model PPP contract for different services would be helpful to them. They have also stated the guidelines that are specific to different municipal services would be helpful as these would help to clarify some of the legislative grey areas, particularly if the service being provided is broken up into its constituent components, this will provide clarity on what is, and what is not, a municipal service. The European Union has guidelines on the formation of legislation to regulate the terms and conditions of PPPs which may assist in this regard (Box 9).

**Box 9: European Guidelines for successful PPPs**

The European Guidelines note that a PPP requires a number of contractual agreements corresponding to the number of parties involved. While the naming conventions may differ in different countries, the main documents include the Project Agreement, Performance Specifications, Collateral Warranties, Construction and Operating Contracts and Financial Security and Guarantee Arrangements (European Commission, 2003: 40). It is crucial that these documents are prepared in a “transparent manner and that clauses are fully understood by concerned parties” (European Commission, 2003: 40). In addition to this, the current procurement rules of the Commission are designed to “ensure transparency, open participation and cost-effective solutions based on fully specified tender conditions.” (European Commission, 2003: 42).

To address the issue of downstream water rights, the DWS needs to undertake reconciliation studies of affected catchments to determine the ecological reserve requirements from wastewater effluent. Legislative clarity is also needed on the rights of downstream users to treated wastewater flows. These requirements should be included in the water use licenses for the treatment works to provide certainty around reuse potential. The quality of downstream effluent can also potentially be improved by industrial water reuse schemes that free up potable use, which can in turn increase the wastewater volumes to make up for the diverted effluent (Box 10).

**Box 10: The multiple potential benefits of industrial reuse – the case of Flag Fen, Peterborough, UK**

The Flag Fen wastewater reuse scheme in Peterborough, UK, involved the diversion of municipal treated wastewater to an adjacent power station (Mediterranean Wastewater Reuse Working Group, 2007). The effluent was originally being discharged upstream of an environmentally sensitive Special Protection Area. The treated effluent was further treated to provide a more appropriate supply to the power station and to free up fresh water for urban use. While there was concern about the impact of downstream flow reduction on the environment, this was deemed to be a short-term impact as the additional water resources to support growth would soon provide additional wastewater to make up for the initial

reduction in downstream flows. In addition, the adjacent plant could provide the required energy for the reverse osmosis process. The location of the treatment plant on the site of the existing wastewater treatment works also avoided a number of potential regulatory barriers.

## 4.2 Capacity

The DBSA, together with the DWS, is in the process of trying to set up a municipal water reuse project office to be housed within national government. This office would be modelled on the successful Independent Power Producers office which was set to manage the public procurement of renewable energy. The water reuse project office would provide support to municipalities, produce standard tender and contract documentation and undertake technology research and evaluation for pre-approval.

Should the DBSA initiative not materialise, then alternative capacity building programmes should be undertaken in municipalities to support the packaging of projects and the managing of PPPs. This could take place through a dedicated municipal PPP unit under National Treasury, or through supplementing the existing general capacity support to municipalities provided by the Municipal Infrastructure Support Agency (MISA), administered by the Department of Cooperative Governance (DCOG), but focussing on contract management capacity. There is interest in capacity building for PPP implementation from DFIs and multilateral organisations, such as USAID, who are working with the GTAC PPP unit to strengthen the team to assist in the implementation of PPPs. Other donor agencies (such as AFD) are interested in moving into the municipal PPP space, but are awaiting the update of the PPP Regulations. An alternative means to address municipal capacity constraints is to form a public or private entity to manage the water reuse schemes for multiple municipalities (Box 11).

### Box 11: Public entity consortium to address reuse capacity constraints in Spain

The Costa Brava Consortium (CCB) is a public entity created to manage water reuse of 27 local authorities (<http://www.ccbgi.org>). Since 1989, the CCB has developed 126 projects to treat over 3000 Ml of municipal wastewater effluent per year for reuse on golf courses, non-potable urban use, agriculture and aquifer recharge. (Mediterranean Wastewater Reuse Working Group, 2007)

IFC has a programme to provide free transaction advice in support of PPPs. The programme was set up with grant funding and currently operates using a reimbursable grant model, whereby the municipality being supported does not pay for the transaction advice, which are reimbursed through a success fee paid by the winning bidder. This revenue is then used to provide advice to the next municipality. The programme currently operates in Durban and Gaborone, and is looking for funding to expand to 10 more municipalities. The estimated cost of the transaction support is between €1 million and €2 million per project. The benefit of the programme is that it provides the necessary support to get projects going and lowers the transaction costs.

### 4.3 Political

Political barriers did not emerge as the most significant barriers to PPPs. These are probably best addressed through demonstrating at a national government level the benefits of PPPs through international experience. Local level political barriers are usually dealt with by local mayors and councillors, who can be supported by robust and competent technical expertise providing the necessary data and evidence to support negotiations and decisions.

### 4.4 Technical

The needs for large scale treatment plants in proximity of a significant industrial demand means that reuse schemes are likely to be limited to the eight metros and intermediate city municipalities (secondary cities) with large industrial bases (Rustenburg, uMhlathuze, Drakenstein, Emfuleni, Steve Tshwete, etc.). The coastal cities would be the easier options to circumvent some of the potential regulatory barriers, but the larger industrial customers are located in Gauteng. A valuable intervention in this space would be to map the locations of large industrial water users in relation to municipal wastewater treatment works (of a given size) to be able to identify the most promising geographic areas for PPP projects.

To improve innovation in the water sector, including through reuse, the Department of Science and Technology has collaborated with the DWS and the Water Research Commission (WRC) to develop a Water Research, Development and Innovation Roadmap. International support can be provided to this initiative to transfer technology and lessons learned elsewhere. South Africa, through the WRC has recently become a member of the Water Joint Planning Initiative which seeks to promote cross-border collaboration of European member states and “address water challenges and EU policy priorities in the water sector within a global perspective” (<http://www.waterjpi.eu/>).

### 4.5 Financial

The Infrastructure Investment Programme for South Africa (IIPSA), managed by the DBSA, is a joint programme between the governments of South Africa and the EU, amounting to €100 million. The main intention of IIPSA is to assist in the delivery of infrastructure to enhance sustainable economic growth in Southern Africa. IIPSA funding is available as a grant for project preparation, a grant for technical assistance, a direct grant for project implementation, interest rate subsidy or a loan guarantee cost finance or insurance premium cover. Qualifying public entities can apply for funding from the DBSA. A key focus of IIPSA is ‘water and environment’ into which water reuse fits. As of September 2019, IIPSA was 70% committed. It has predominately been spent on project preparation grants, although few of these have been for PPPs. IIPSA ends in 2020.

IIPSA have funded the second part of the DBSA’s water reuse initiative, which is the development of a new blended financing solution specifically for wastewater reuse projects. This instrument is in the process of being designed and piloted. DBSA intends to define water reuse infrastructure as a new asset class, but not specify the technology that is used. The finance solution will take the form of project bonds, which can be on the balance sheet of municipality (if possible and desired) or through an SPV. A credit rating will be determined based on the project. DFIs are being involved to offer credit enhancement facilities (e.g. first-loss facility) to de-risk the projects. Due to the initial IIPSA funding of the programme, IIPSA

DFIs (KfW, EIB, AFD) have been given an option to provide 40% of the credit enhancement funding. The DBSA aims to collect a portfolio of projects from which investors can select projects for investment.

The first pilot project is likely to be the uMhlathuze reuse project (See Box 12). Once bidders have been shortlisted, the DBSA will offer the product to them as a financing solution.

**Box 12: uMhlathuze water reuse**

uMhlathuze municipality is conducting a feasibility study for the treatment of raw sewage and sale of effluent to industry. The project is anticipated to cost in the region of €125 million, and due to its scope, scale and involvement in the delivery of a municipal service, this project is likely to be a PPP.

The project is currently awaiting views and recommendations from National Treasury.

Another potential finance solution proposed by the DBSA, for under-resourced municipalities and intermediate city municipalities is to set up a funding entity to raise loans based on the projected future revenue from national grant transfers. While this type of pledging is permitted, municipalities are reluctant to commit to a long-term project when only 3 years of national grant funding is certain. The loans raised would price in the risk associated with the uncertain levels of grant funding in future, but this risk can be lowered with credit enhancement facilities provided by DFIs. A BOT contract would be a condition of the financing agreement to ensure that the technology is appropriate and that it can be operated sustainably to provide the required revenue.

The problem of loss of municipal revenue as a result of water reuse can be addressed through the mechanism that has been proven in Durban, whereby the private party compensates the municipality for loss of revenue. However, the Durban case showed that subsidisation of the water reuse scheme may be necessary if it helps to achieve subsidisation. This problem is not unique to South Africa and India runs a successful PPP programme that is 60% subsidised by national government.

The issue of low water tariffs has both short-term and long-term potential solutions. The short-term solution is to focus PPP efforts in water-stressed municipalities with relatively high industrial water tariffs to increase the attractiveness of reuse. The longer-term solution is to promote cost-reflective tariffs in municipalities. This has been the subject of multiple interventions by National Treasury, DCOG and the South African Local Government Association, but is only improving slowly.

## 5 Potential role for European businesses

---

### *As financiers*

The IIPSA-funded programme run by DBSA to establish a water reuse project office has opened the opportunity for European DFI funding into the reuse finance facility. This opportunity is focussed on funding for credit enhancement and not the senior loan, as there is evidence that

there is sufficient capital in the local market to fund projects. A further opportunity would be to partner with the IFC to fund their reimbursable grant model for transaction advice.

#### *As technical advisors*

Given that the PPP regulations require the appointment of a transaction advisor, every PPP will present opportunities for experienced individuals and firms in providing transaction advice. The greater experience of EU firms and professionals relative to South African counterparts provide some advantage in these appointments.

#### *As PPP partners*

European firms are already present in South Africa and bidding for reuse projects in the country and the region. A PPP specialist advisor reported that 90-100% of bidders on water PPPs in the Southern Africa region were European firms, as they have the expertise and have established a niche in the market. To date there has been limited interest from American or Asian firms.

The Veolia case in Durban has demonstrated that European firms have the technology, as well as the capability of operating in a South African context, to successfully build, own and operate water reuse facilities to the mutual benefit of the company and the municipality. European firms have the expertise and technology to improve quality of wastewater treatment, with the immediate environmental benefits, but also to stimulate the market for water reuse through increased consistency and reliability. The transfer of these skills to South African operators and managers would be a great benefit to the sector. Water Reuse Europe is an industry representative body, and Water Europe, a member-based multi-stakeholder platform, are two organisations well placed to share experience and knowledge (Box 13).

#### **Box 13: Water Reuse Europe and Water Europe**

The specific objectives of Water Reuse Europe are to (<https://www.water-reuse-europe.org/>):

- To facilitate knowledge exchange amongst public and private entities involved in water reuse;
- To promote European expertise and services in water reuse to a global audience;
- Support European companies (particularly SMEs) in their efforts to commercialise water reuse solutions;
- Raise public awareness and understanding of water reuse practices; and
- Promote research and innovation on water reuse.

The Water Europe mission is to (<https://watereurope.eu/>) :

- Improve coordination and collaboration in the water sector and water using sectors in the EU and beyond;
- Enhance the performance and competitiveness of the European water sector and water using sectors.; and
- Contribute to solving global challenges through research and innovation.

*As technical suppliers*

The water reuse project office proposed by the DBSA will enable EU firms to showcase technology, influence project specification, and potentially be pre-approved as potential service providers to municipalities. The country is already heavily dependent on imported technology<sup>9</sup> but the EU is under-represented in the market.

---

<sup>9</sup> Pipes, pumps, valves and automation and control equipment.



## 6 References

---

### 6.1 Relevant legislation

#### National level

The Public Finance Management Act (PFMA), 1999

National Treasury Regulation 16 to the PFMA, 2000

National Water Act (number 36 of 1998)

#### Municipal level

The Municipal Finance Management Act (MFMA), 2003

The Municipal Systems Act (MSA), 2003

The Municipal PPP Regulations, 2005

The Preferential Procurement Policy Framework Act, 2000

The Municipal Supply Chain Management Regulations, 2005

### 6.2 Bibliography

Bhagwan, J. 2012. "Guidelines for Water Reuse: Durban Water Recycling Project." Water Research Commission, Pretoria, South Africa.

Braybrooke, C., 2019, Durban Water Recycling Project. Presentation at the Water Institute of South Africa's Water Reuse Symposium, 18-19 September 2019, Birchwood Conference Centre, Johannesburg.

Castalia Strategic Advisors. 2007. Key Challenges to Public Private Partnerships in South Africa. Finding a Way Forward. Presidency of the Republic of South Africa and the Business Trust.

Department of Water and Sanitation, 2011, Development of a Reconciliation Strategy for the Olifants River Water Supply System; Future Water Reuse and other Marginal Water Use Possibilities. Pretoria.

Department of Water and Sanitation, 2018, National Water and Sanitation Master Plan. Pretoria.

Du Toit, G. 2019. Potable Reuse in the City of Cape Town to Improve Water Supply Resiliency. *Water Institute of South Africa Water Reuse Division*.

Durban Water Recycling Project, 2019. "Creating Value from Waste Water". Durban Water Recycling, Durban, South Africa. Available: [http://forum.tips.org.za/images/The\\_Durban\\_Water\\_Recycling\\_Project\\_Creating\\_Value\\_From\\_Waste\\_Water\\_-\\_Chris\\_Braybrooke\\_Veolia\\_Water\\_Technologies.pdf](http://forum.tips.org.za/images/The_Durban_Water_Recycling_Project_Creating_Value_From_Waste_Water_-_Chris_Braybrooke_Veolia_Water_Technologies.pdf)

European Commission: Directorate-General Regional Policy. 2003. *Guidelines for Successful Public-Private Partnerships*. Available: [https://ec.europa.eu/regional\\_policy/sources/docgener/guides/ppp\\_en.pdf](https://ec.europa.eu/regional_policy/sources/docgener/guides/ppp_en.pdf)

German Missions in South Africa, Lesotho and Eswatini. 2018. *Germany Provides Funding for Urban Wastewater Management in City of Cape Town*. Available: [https://southafrica.diplo.de/sa-en/04\\_News/-/2162732](https://southafrica.diplo.de/sa-en/04_News/-/2162732) [2019, October 3].

GreenCape, 2019, Water Market Intelligence Report. Cape Town. Available on <https://www.greencape.co.za/assets/Uploads/WATER-MIR-2019-WEB-01-04-2019.pdf>

Lawless, A, 2017, Numbers and needs in local government – where are we now? Civil Engineering, January/February 2017: pp 15-26

Marais, P. & von Durckheim F. 2012. Beaufort West Water Reclamation Plant: First Direct (Toilet-to-Tap) Water Reclamation Plant in South Africa. 75<sup>th</sup> IMESA Conference. Available: <https://www.imesa.org.za/wp-content/uploads/2015/08/Paper-6.pdf>

Mediterranean Wastewater Reuse Working Group, 2007, Mediterranean Wastewater Reuse Report Annex B: Case Studies. Available: [https://ec.europa.eu/environment/water/water-urbanwaste/info/pdf/final\\_report\\_annex\\_b.pdf](https://ec.europa.eu/environment/water/water-urbanwaste/info/pdf/final_report_annex_b.pdf).

Naroth, N. 2016. *Assessing the Sustainability of Direct Potable Water Reuse: The Beaufort West Reclamation Plant*. : University of Witwatersrand. Available: <http://wiredspace.wits.ac.za/jspui/bitstream/10539/22963/1/Assessing%20the%20Sustainability%20of%20Direct%20Potable%20Reuse.pdf>

National Business Initiative. 2019. Kopano Ya Metsi. Report series on PPPs in water and sanitation in South Africa. Available online: <https://www.nbi.org.za/focus-areas/environmental-sustainability/water/kopano-ya-metsi-meeting-for-water/>

National Planning Commission. 2013. National Development Plan 2030: Pretoria.

National Treasury. 2007. Municipal Service Delivery and PPP Guidelines. National Treasury PPP Unit: Pretoria.

National Treasury. 2017. The State of Local Government Finances and Financial Management. Pretoria.

National Treasury. 2019. National Budget Review. Pretoria.

Reddy, Y. & Siqalaba, Z. 2018. NRW and Wastewater Financing in South Africa: Market Size, Barriers and Opportunities for SWPN South Africa. PwC Services South Africa

SALGA, 2017, The role of municipalities as a service authority for solid waste management, Pretoria: South Africa.

Serumaga-Zake, S. 2015. *The Key Success Factors in Water Infrastructure Financing: A Case Study of the Rustenburg Water Services Trust*. Stellenbosch University. Available: <https://scholar.sun.ac.za/handle/10019.1/99393>

Water and Wastewater Engineering. 2019. Beaufort West WRP: First Direct Water Reclamation Plant in South Africa.

World Bank Group. 2016. Municipal Project Finance in the Municipality of Rustenburg (South Africa). *Case Studies in Blended Finance for Water and Sanitation*. Available: <http://documents.worldbank.org/curated/en/959781472033563640/pdf/107980-South-Africa.pdf> [2019, October 11].

World Bank Group, 2018. "Wastewater: From Waste to Resource. The case of Durban, South Africa." World Bank, Washington D.C, U.S.A. Available: <http://documents.worldbank.org/curated/en/770121521179248609/pdf/124334-19-6-2018-13-8-54-W.pdf>

## Annexure A: Case studies

---

This section consists of case studies of PPPs from various sectors in South Africa and abroad. Insights are given in each of the case studies as to how some of the challenges that were described earlier have been overcome.

### 1.1 Durban Water Recycling

In the 1990's Durban was facing sewerage capacity constraints, as the existing infrastructure could not cope with the growing population as well as economic development (World Bank Group, 2018). In addition, Mondi Paper had approached the city of Durban in 1993 to request recycled water, at a lower rate than potable water (Durban Water Recycling Project, 2018). Given these developments, the municipality had to develop a plan for a wastewater treatment plant that was able to cater for the increased demand. The solution that was identified was a plant consisting of an upgrade of the existing activated sludge process from 50 MI/d to 77 MI/d) and the construction of a new 48 MI/d tertiary (final treatment) plant. The idea was to upgrade the treatment plant, which was at the time only undertaking primary treatment prior to discharge to the sea, and undertaking secondary and tertiary treatment to industrial quality for reuse.

After the municipality reviewed the technical capabilities of its sanitation division (eThekweni waste services), it was evident that the municipality was not able to implement a project of this magnitude. In addition, a financial feasibility study was performed, which demonstrated that this project was well suited to attract private capital. Based on these studies, eThekweni invited international tenders for a public-private partnership (PPP) to achieve this project.

The 20-year concession contract was awarded to the Veolia Water Systems consortium in 1999, with Veolia Water Solutions and Technologies as the lead, Zetachem, Khulani Holdings Limited, Umgeni Water and Marubeni. The contract is a Build-Own-Operate-Transfer (BOOT) contract, valid until 2021 (World Bank Group, 2018), making it the first PPP of its kind in South Africa. Importantly, this PPP was developed prior to the current PPP legislation, which was promulgated in 2003. Construction of the wastewater treatment plant began in 2000 and it is designed to treat 48 million litres per day (10% of the municipality's wastewater). A total investment of R72 million (€4.5 million) was required for the project. This cost was covered by the equity from the consortium which amounted to R14 million, the Development Bank of Southern Africa (DBSA) who contributed R34 million, as well as the Rand Merchant Bank (RMB) who contributed R24 million (World Bank Group, 2018). The first water sales were made in 2001 to the clients, Mondi Paper and the South African Petroleum Refineries (SAPREF), with 85% of the treated water going to Mondi Paper and 15% to SAPREF (Durban Water Recycling Project, 2018). Because Mondi produces fine paper, the water sold to them must be of a high-standard quality, which the plant produces. The consortium pays an annual management fee to the municipality, as well as an annual fee for the lease of the municipal land on which it is located. Importantly, the consortium also pays a fee to the municipality to account for lost cross-subsidisation opportunity from the industrial consumers.

There are 32 contractually specified quality parameters that the treated water must comply with. These include removing 95% of the incoming COD (to a maximum of 15mg/l) and 98% of incoming ammonia (to a maximum of 0.2mg/l) loads. There are other requirements

specifically around levels of iron and other metals, due to the high requirements for the paper production processes. In practice, the water is treated to 96% of Class 1 potable standard (Bhagwan, 2012).

The plant has minimised wastewater that is released to the environment, with 98% water utilisation efficiency. At 98% of design capacity, the plant reduces the city's water consumption by 7% and sea outfall pollution by 24% (Durban Water Recycling Project, 2018). The reduction in potable water usage has enabled 220 000 households to have access to this water (Braybrooke, 2019). This has contributed to sewage now being considered a potential natural resource.

The case of Durban is an example of a successful and innovative PPP to improve the sustainability of wastewater management, minimising environmental impact and having multiple benefits for the community. The city was able to implement a design solution that served multiple interests and that leveraged the local conditions to benefit all stakeholders. The project is current under review to determine whether to put the project out to tender for a further 20 years.

## **1.2 Drakenstein non-potable water reuse project**

Drakenstein Municipality is a medium-sized intermediate city municipality in the Western Cape with a population of approximately 280 000 people. The region experienced a major drought from 2015 to 2018. Drakenstein municipality buys 93% of its potable water from its neighbouring municipality, the City of Cape Town. This, combined with the drought, placed significant emphasis on the municipality finding alternative water sources.

The municipality has appointed a consulting team to investigate the possibility of water reuse in the municipality. The consultants found that this was a technically feasible solution, as there was significant demand for water from various sectors, including agricultural, sports fields, industries and the residential sector. The financial component of the feasibility study indicated that the proposed reuse plant could produce potable water at a rate which was significantly more expensive than the purchase price of the water currently from the City of Cape Town. The reason for this was predominately due to the small size of the plant (10MI/d), but also the extremely low potable water price paid to the City of Cape Town. The financial model also indicated that the treatment of water to potable standards could improve the viability of the project, as the catchment is smaller, therefore less infrastructure is required to reach potential customers.

This contract has not been issued to public tender, as the drought in the Western Cape has broken. The contract is still likely to proceed, but with less urgency. It is undetermined at this stage whether this project will be a PPP or not.

Drakenstein Municipality has attempted a PPP for a waste-to-energy plant. However, this project was recently abandoned on procedural grounds, 10 years after the project was

originally conceptualised. The process did not follow the process prescribed in the PPP, and was thus halted by a ruling from the National Treasury.

### **1.3 Beaufort West water reuse**

Beaufort West is a town in the inland Great Karoo region with a population of 34 000 people. Being in an arid region, Beaufort West has no perennial rivers and is therefore heavily reliant on rainfall for water supply. The Gamka Dam, which stores surface water, as well as the multiple boreholes, work in conjunction to provide water to the communities in the drought-prone area.

Since there have only been two historical sources of water, the Beaufort West Municipality had been considering water as a strategic resource for a long time. The 2010 drought put the plan into motion, as the dam dried up and 50% of the boreholes began to fail (Beaufort West WRP, 2019; Narooh, 2016). After the drought, the municipality developed strategies for the short term, medium term and long term, which respectively focused on water demand management, increasing the water supply as well as developing a field of boreholes 30km's out of town, which were envisioned to operate in conjunction with a wastewater reuse plant (Beaufort West WRP, 2019; Narooh, 2016). After the long-term strategy had been devised, the municipality then embarked on a plan to implement the discussed water reclamation plant, requesting tenders for the design, build and operation of the plant under a 20-year service-level agreement (Narooh, 2016). After reviewing the various submissions, the tender was awarded to Water and Wastewater Engineering (W&WWE).

The municipality is currently in a performance-based 20-year BOT PPP concession agreement with W&WWE, meaning that if the water does not meet the required standard (potable) then the plant will automatically shut down (Narooh, 2016). There have been no instances of the water being below expected quality, and this is attributed to the innovative design adopted by W&WWE to ensure optimal removal of organics and harmful pathogens in water in order to make it safe for consumption (Narooh, 2016; Marais, 2012). The design was focused on intense pre-treatment with multiple removal of determinants.

Despite the beneficial outcome, it was not without its challenges. The municipality had to overcome convincing the community that the reclaimed water will be safe for consumption, and this was achieved through school tours through the plant, as well as multiple presentations and information sharing sessions (Marais, 2012). There were also religious concerns from the Muslim community on whether or not the water being consumed would not infringe on their beliefs. However, this was settled through consulting legislation from Saudi Arabia (source of Islamic legislation) (Marais, 2012). Lastly, political buy-in was necessary, and was attained through the principle of 'equal water for all' (Marais, 2012).

The plant is currently fully operational and is delivering water that is complying with the SANS 241-1:2011 (Edition 1) and has unlocked a significant water source that has historically been overlooked.

### **1.4 City of Cape Town indirect water reuse**

The City of Cape Town has, for a long time, considered water reuse to improve the city's water supply resilience, with water reuse also being a key component of the recently approved water strategy. In 2018, the city received a R1.3 billion loan from the German government owned

KfW Development Bank, which is to be used for urban wastewater management (German Missions, 2018). This loan is meant to target energy-efficient, economical and sustainable urban wastewater management through the expansion and refurbishment of some of the city's 25 wastewater treatment plants over the next few years (German Missions, 2018).

Additionally, a recent WISA presentation highlighted the discussion of a possible new water production scheme. It is proposed to be a permanent 70 ML/d (with allowance to expand to 100 ML/d in the future) scheme that will source treated wastewater from the proposed upgraded Zandvliet WWTW (du Toit, 2019). The water will be treated in an advanced treatment plant sited at the Faure water treatment plant campus, with the produced water then being blended with dam water at the inlet to the Faure WTP, where it will undergo further treatment. This scheme is proposed to begin in 2024 and is currently in the design phase (du Toit, 2019).

## 1.5 Rustenburg

Rustenburg Local Municipality is an intermediate city municipality with a population of around 600 000 and an economy centred on platinum mining. The municipality has experienced constrained water supply since the 1990's, with much of the available supply becoming contaminated with effluent due to the failing infrastructure of the wastewater treatment facilities (World Bank Group, 2016; Serumaga-Zake, 2015). In addition to the failing infrastructure, the municipality lacked institutional and financial capacity to upgrade the existing infrastructure. The municipality then approached the private sector for a potential solution, at the same time that the mining sector offered support in identifying a way to address the urgent water and wastewater treatment needs (World Bank Group, 2016).

After putting out a Request for Proposals, the Mati Ya Vanhu consortium consisting of Magalies Water (the bulk water board) as the operator, ABSA bank as the lead arranger and financier and Rustenburg Consulting, led by Bigen Africa (a consulting engineering firm), was procured to implement the project (World Bank Group, 2016; Serumaga-Zake, 2015). The consortium and the municipality created the Rustenburg Water Service Trust (RWST), a municipal entity which operated as a Special Purpose Vehicle (SPV) for the project (World Bank Group, 2016). The RWST signed a 25-year concession contract with the municipality to design, finance, upgrade and operate the facilities to be upgraded (World Bank Group, 2016; Serumaga-Zake, 2015). This initiative was supported by Anglo-Platinum and Impala Platinum, who agreed to purchase the non-potable treated wastewater that the treatment plant produced.

RWST obtained a loan of R280 million (€17 million) from ABSA on a 20-year term. This was possible mainly because ABSA was confident that the specialists involved were able to adequately design and operate the facilities, therefore maintaining the flow of effluent, resulting in a reliable revenue stream (World Bank Group, 2016). Financial close for the deal was achieved in December 2003, followed by construction in January 2004 (World Bank Group, 2016). The sale of treated wastewater to the mines makes up 50% of the SPV's revenue, with the other 50% coming directly from the municipality to the RWST for the supply of raw water and provision of sewerage services (World Bank Group, 2016).

The infrastructure has been successfully operated since the project inception, with a financially sustainable bulk water and sewerage system being established with cash reserves

of R177million (€11 million) after seven years of operation (World Bank Group, 2016). A key learning from the Rustenburg case is that there is increased investor confidence through the use of a SPV, as the transfer of funds between the RWST and the municipality is governed by the trust's constitution, which was drafted by all parties involved. Therefore, political issues that are typically encountered by PPP's were avoided, more specifically those associated with handing over public resources to the private sector.

### **1.6 City of uMhlathuze non-potable water reuse project for industries**

The City of uMhlathuze is a large intermediate city municipality on the east coast of South Africa, with a population of approximately 400 000 people. It is a large port city and has an extensive industrial base. The port handles in excess of 80 million tonnes annually, representing approximately 60% of South Africa's cargo. In order to grow further it is in need of an adequate supply of water to both industry and the residential population.

In March 2018, the City released an Expression of Interest for parties who are able to establish wastewater treatment plants for the treatment and delivery of wastewater and associated by-products to offtakers. This project is ongoing, and a feasibility study has been conducted, indicating that, due to the scale and scope of the project it will likely be a PPP. The project will provide non-potable water to industry located near to the site.

The project is currently awaiting approval from the National Treasury. If the feasibility study is approved, then the procurement phase will begin. DBSA is intending to offer a new funding solution to shortlisted bidders which will lower the financing risk through various credit enhancement mechanisms. If successful, this will be the pilot project for the new financing mechanism.

### **1.7 Overstrand water treatment 15-year contract**

In Overstrand Municipality, a 15-year service contract was signed with a private sector partner, Veolia, to operate and maintain bulk water services infrastructure. This contract was awarded in November 2015 and was done so in terms of Section 33 of the MFMA. This is a large contract but does not fit the definition of a PPP because the private contractor was not taking on 'substantial' technical or financial risk, and therefore did not need to follow the processes set out in the PPP Guidelines.

Due to Section 33 of the MFMA, the contract went out for comment from the public and organised labour. Labour appealed the contract due to potential loss of work, so these employees were taken over from the municipality by Veolia.

### **1.8 Saldanha Bay industrial water use**

ArcelorMittal is a steel fabricator in Saldanha Bay. The plant requires approximately 6 Ml/day of water for its processes. Historically, the plant has mostly relied on water from the municipality, supplemented by small boreholes on site. The drought in the Western Cape affected the supply of water to the plant, which had the potential to cause severe damage.

The municipality approached ArcelorMittal to reduce their water consumption, and it was agreed that treated effluent could substitute potable water for some of the processes. The municipality and ArcelorMittal agreed to spend approximately €1 million to transport the



treated effluent from the wastewater treatment works to the plant for use on the plant. This has reduced the demand for potable water by 20-25%. However, due to challenges in the local and global economy, the price of electricity and the drop in the price of steel, ArcelorMittal is currently struggling financially. The company approached the municipality to reduce the price of the treated effluent, as the business was struggling with commercial viability. The municipality agreed, as the company had helped them with the infrastructure investment when they had requested it. The company is currently paying a negligible amount for the treated effluent and will continue to do so for a defined amount of time.

### 1.9 Water reuse in Olifants River catchment

There is extensive water reuse in the Olifants River catchment, in Mpumalanga Province – approximately 38MI/day from domestic sources and 205 MI/d from industrial wastewater. This non-potable water is used for a variety of purposes including industrial process water, irrigation and mining usage. In addition to this, acid mine water is reclaimed and treated for potable and non-potable use.

There are three main modalities that are used by businesses in the area to access this water:

- **Reuse of own water:** The private partners reuse their own process water. This can either be through treatment and reuse for the same purpose, or through a cascading approach, whereby the quality of the water decreases as it progresses through different uses.
- **Purchase of effluent from municipality:** Some users in this catchment have effluent purchase agreements in place with Emalahleni Municipality, with a guaranteed volume to be purchased by the private party, with an allowance for deviations, and a volumetric rate for purchases above the agreed threshold. In these circumstances, the private partner put in the infrastructure, and transferred this to the municipality. The contract with the municipality has an agreed effluent quality, however this has frequently been exceeded. The private partner in this case is unwilling to levy the agreed upon fine on the municipality, as this would likely destroy the relationship between the parties. The private partner has installed further treatment capacity at their own cost on their own premises to ensure water quality.
- **Public-Private Partnership:** The Emalahleni Water Reclamation Plant at Emalahleni is an initiative driven by Anglo Coal in partnership with BHP Billiton and Emalahleni Local Municipality. This plant reclaims acid mine drainage water and treats this to potable quality. The HiPRO (Hi recovery Precipitating Reverse Osmosis) plant produces 50 MI/d at 99% efficiency. The water is sold to domestic customers, bottled, released to the environment for ecological reserve purposes, and used onsite (Department of Water and Sanitation, 2011).

## Annexure B: Interview schedule

### Primary sources

Stakeholder type	Organisation	Name	Position
<b>National government</b>	PPP Unit: GTAC	Strover Maganedisa	Head: PPP Unit
<b>Private sector</b>	Veolia	Chris Braybrooke	General manager: Marketing
	Atrenew	Johan Louw	Transaction Advisor
	ArcelorMittal	Juan Pedro Jimenez Navarro	General Manager: Saldanha Works
	Anglo American	Alfred Mbewe	Senior Civil Engineer
<b>Local and EU DFIs</b>	DBSA	Johann Lubbe	Deal Originator
	DBSA	Zweli Sapula	IIPSA
	International Finance Corporation (IFC)	Dan Shepard	Regional lead: sub-Saharan Africa
	International Finance Corporation (IFC)	Nico Saporiti	Senior Investment Office: Infrastructure and Transaction Advisory
<b>Municipalities</b>	Overstrand	Hanré Bignaut	Deputy Director: Infrastructure

### Secondary interview sources.

A series of interviews were conducted by PDG for the African Development Bank (AfDB) to assist in the development of a sub-national strategy. The interviews investigated other stakeholders' opinions on the best role that AfDB could play.

Stakeholder type	Organisation	Name
<b>DFI</b>	USAID	Paul Graham & Allan Hackner
	AFD	Carl Bernadac
	NDB	Thabo Rakoloti
	World Bank	Gert van der Linde
<b>Municipalities</b>	eThekwini	Linda Eniker (Deputy Chief Investment Officer)
	Drakenstein	Jacques Carstens (CFO)

*Secondary sources (WISA Water reuse conference)*

Presentation title	Organisation	Name
DPR in Windhoek, overview of the history, current situation and future -	Wingoc/Veolia	Dr Thomas Honer
The rejuvenation of the SA Water and Sanitation sector via SA Water Chamber	SA Water Chamber	Benoit Le Roy
The Value of Water Reuse and economic impact in changing lives -	University of Namibia	Prof Damas Alfred Mashauri
sustaining water services delivery through water reclamation and reuse in the SADC Region	Nafasi Water	Suzie Nkambule
Water reuse policy and regulations, where are we and what are the requirements to drive implementation in order to realize the NDP 2030 and SDG 6 targets	WR Nyembeze & Associates	Dr WR Nyembeze
Implementation of a Water Reuse Plant-Cost implications	Lyners & Associates	Carel Davids
Programmatic and funding approach to establishing water reuse infrastructure as a new asset class in South Africa	DBSA	Johann Lübbe
The eThekweni Metro Remix plant	eThekweni Municipality	Sydney Masha
The circular economy, Durban recycling project, creating value from waste	Veolia	Chris Braybrooke
Public perceptions and acceptance of water reuse	Future Water, University of Cape Town	Dr Germaine Owen
Water Reuse, what does the public know	Private consultant for WRC	Dr Sarah Slabbert
Beaufort West water reuse, towards 10 years of operation	Water & Wastewater Engineering	Pierre Marais
Industrial water reuse- Challenges and opportunities in a water scarce environment	Royal HaskoningDHV	Kirshen Naidoo

<b>Potable water reuse in the City of Cape Town to improve Water Supply Resiliency</b>	Aurecon	Geoff du Toit
<b>Reflections from Water Reuse 2019, Overview of water reuse landscape in the USA</b>	Aurecon	Brendon Theunissen
<b>Water reuse, Lessons from South Africa and abroad</b>	TCTA	Jeremiah Mutamba
<b>Funding, developing and preparing water reuse projects, DBSA experiences -</b>	DBSA	Dr Mthokozisi Ncube
<b>Water policy and regulatory aspects for water reuse</b>	ERWAT	Tumelo Gopane