

Guidelines for setting water tariffs

With a Focus on Industrial, Commercial and Other Non-residential Consumers

Executive Summary

Commerce and industry represent a major grouping of water consumers in most local authorities, consuming up to 50% of the water supplied in larger municipalities. These enterprises also have significant impacts on the local economy, society and the environment. Yet surveys have revealed significant inconsistencies in the manner in which municipalities set tariffs for these consumers.

The Water Research Commission has already established a guideline on setting water tariffs, in the form of a module in the *Management guidelines for water service providers*. However, this module concentrates mainly on water tariffs for residential consumers. These guidelines have therefore been developed to assist Water Managers in setting tariffs for non-residential water use, focusing specifically on commercial and industrial water tariffs.

The guidelines have been written for water managers in Water Services Authorities (WSAs) and Water Services Providers (WSPs) who are involved in setting retail water prices, that is, water prices to the end-user. They propose the following tariff reform process:

1. **Understand the national context.** The roles of various institutions involved in water supply are described, together with the relevant national water pricing policies.
2. **Understand the local context.** A broad range of factors are outlined which tariff reformers may wish to consider to better understand their local context. These include the local institutional, historic, economic and water resources context, the consumer market, the costs of supply, revenues and current tariffs. Given the political nature of tariff-setting practitioners are strongly advised to undertake a stakeholder analysis.
3. **Set pricing goals, establishing principles and develop performance indicators.** Practitioners are advised to define pricing goals and to prioritise or weigh these as far as possible. A basic set of principles are proposed for good tariff practice. Various practical indicators are proposed with which to measure organisational performance.

4. **Make some preliminary choices.** The possible components of the water tariff are described, including development charges, connection charges, fixed fees and volumetric tariffs. Two approaches are described for determining tariff levels: the revenue requirements approach and the marginal costs approach. The user is advised to consider the impact of future supply costs and climate and to examine the scope for cost reductions when determining revenue requirements. A set of guidelines are provided to assist with these choices, covering universal cases and specific conditions.
5. **Define the tariff structure and set tariff levels.** Users are advised to establish a tariff policy framework on the basis of the selected goals, and to use this for further consultation.
6. **Undertake consultation and evaluation exercises.** The likely impacts of tariff reform should be evaluated before approval is sought. Depending on the outcome of the stakeholder analysis, and the extent of the proposed tariff reform, it may be necessary to consult stakeholders prior to seeking political approval. Long term evaluation procedures should be set up to establish whether the tariff reforms are achieving the desired pricing goals.
7. **Refine tariffs.** Users are advised to undertake incremental reforms to tariff structures and levels until they achieve desired goals and adhere to best practice principles.

A key conclusion of the research is that there is no practical system to implement inclining block water tariffs for non-residential consumers.

The guidelines also describe some tariff refinements for special cases, such as the use of new development charges; seasonal pricing; drought pricing and commodity price-linked tariffs.

Finally, the guidelines review a number of international and local case studies as a means of offering insights into the circumstances of other local authorities. Source documentation for these case studies is available at Palmer Development Group.

1. Introduction

1.1 Who are the guidelines are intended for?

These guidelines are intended for Water Managers in Water Services Authorities¹ (WSAs) or Water Services Providers (WSPs) who are involved in setting retail water tariffs, that is, water tariffs to the end-user.²

1.2 Scope

These guidelines will assist Water Managers with setting tariffs for non-residential water use, but focus specifically on commercial and industrial tariffs.

1.3 Institutional and policy context

Retail water tariffs are affected by the cost of wholesale water (the supply of bulk treated water), which in turn is affected by the cost of the water resource itself, water abstraction and water management. These different functions of water supply are typically (though not necessarily) carried out by different institutions. Although these guidelines focus on retail tariffs, it is important to understand both the institutional and policy context within which these tariffs are set. These are described below.

1.3.1 Organisations involved in water supply

The typical institutional arrangements for water supply in South Africa are shown in Table 1 in terms of the six main functional components of water supply.

Table 1: Organisational arrangements by water supply function

Agency	DWAF as regulator	DWAF as operator	CMA	Wholesale WSP	Integrated WSP	Retail WSP
Water supply function						
Regulation						
Water management						
Resource pricing						
Abstraction						
Treatment & transmission						
Distribution and retail						<i>focus of guidelines</i>

Key: Dark grey = dominant arrangements; light grey = alternative arrangements

DWAF – Department of Water Affairs & Forestry

CMA – Catchment Management Agency

WSP – Water Service Provider

¹ Underlined words and phrases terms are described in the glossary.

² The terminology used for water institutions is specific to South Africa and follows the definitions set out in the Water Services Act of 1997. These terms (and all underlined terms) are described at the end of this report in the Glossary.

The key features of the institutional arrangements are described below:

- **Regulation.** DWAF is the principal regulator of the water sector in South Africa. National water policy is set out in a series of White Papers, especially the White Paper on National Water Policy (DWAF, 1997), and in national water legislation, principally, the National Water Act of 1998 and the Water Services Act of 1997.
- **Water management and resource pricing.** These activities refer to all aspects related to the management of the water resource (including planning, allocation and monitoring) and to the pricing of the water resource itself (the economic value of the water itself independent *as against* the cost of supplying water). The National Water Act makes provision for Catchment Management Agencies (CMAs) to play the lead role in water management and resource pricing in the future, although at present these functions are carried out by DWAF.
- **Abstraction.** Abstraction generally refers to the infrastructure (and related management) necessary to make raw water available for abstraction, such as raw water storage dams. Abstraction is managed by DWAF for most of the large urban schemes. For example, in the case of water supplied to Gauteng from the Vaal River, DWAF manages the Vaal Dam and the major inter-basin transfer schemes supplying water into the Vaal River. Abstraction may also be managed by Wholesale WSPs (typically Water Boards). For example, some of the dams supplying Durban with water are managed by Umgeni Water. For many smaller urban areas, abstraction is managed by a Vertically Integrated WSP. For example, the Stellenbosch WSP manages its own dams in addition to purchasing water from another Integrated WSP (the Cape Town Metropolitan Council).
- **Treatment and transmission (wholesale):** This refers to the bulk supply of treated water, typically including transmission to treated water storage reservoirs located in or near urban areas. This function is typically managed by Wholesale WSPs (Water Boards) but may also be undertaken by Integrated WSPs (typically local authorities) which manage both the wholesale and retail functions.
- **Distribution and sale to the end-user (retail):** This function is generally managed by a Retail WSP (typically a Local Authority) though it may also be managed by an Integrated WSP. Wholesale WSPs may also supply retail services, though this is typically a peripheral activity as their core function is wholesale.

The focus of this guideline is on retail services provided by retail and integrated WSPs.

1.3.2 National raw water pricing policies

The South Africa government released a raw water pricing strategy in 1998. This policy deals with the pricing of:

- **Water abstraction**, that is, the activities involved in abstracting water from the water resource, including the infrastructure costs. The policy limits itself to government owned infrastructure.
- **Water management**, that is, the activities related to the management of water, including water allocation, planning and monitoring.

- **The resource itself**, that is, the water itself. The rationale for this is that the water itself has economic value independently of the costs associated with managing the resource and supplying water to consumers.

The document is titled "National Water Act, 1998 - A pricing strategy for raw water use charges. A strategy document" (DWAF, 1998). This strategy was developed in relation to the Water Policy White Paper (DWAF, 1997) and the National Water Act (RSA, 1998). Key elements of these policies and the raw water pricing strategy are outlined in Appendix A.

1.3.3 Wholesale water pricing policies

The pricing of bulk treated water provided by wholesale WSPs is governed by the Water Services Act of 1997. The key elements of this policy are outlined below:

- **Ring-fencing**: The water wholesale function should be ring-fenced as a separate business unit and regarded primarily as a commercial operation whose aim is to deliver water at the required quality and reliability at the lowest possible cost.
- **Cost-based pricing**. The wholesale tariff should be set as a sum of the cost of the raw water (determined by the national raw water pricing policy) and the costs entailed in the wholesale function (typically treatment, conveyance and storage).³
- **Infrastructure financing**. Finance for infrastructure investments should be sourced from a mix of internal revenue sources and private capital markets at the lowest possible cost. The wholesale function should be financially autonomous and not be dependent on government subsidies.

1.3.4 Retail water tariff policies

The Water Services Act (Act 108 of 1997) provides for the development of norms and standards for the determination of tariffs for water services. The relevant section of the Act is replicated below.

Norms and standards for tariffs

10. (1) The Minister may, with the concurrence of the Minister of Finance, from time to time prescribe norms and standards in respect of tariffs for water services.

(2) These norms and standards may-

- differentiate on an equitable basis between-
 - different users of water services;
 - different types of water services; and
 - different geographic areas, taking into account, among other factors, the socio-economic and physical attributes of each area;
- place limitations on surplus or profit;
- place limitations on the use of income generated by the recovery of charges; and
- provide for tariffs to be used to promote or achieve water conservation.

(3) In prescribing the norms and standards, the Minister must consider, among other factors-

- any national standards prescribed by him or her;
- social equity;

³ Where raw water is provided by a government owned water scheme, the raw water tariff should be used in the cost calculation. Where the extraction of raw water is managed directly by the second tier WSP, the cost of the raw water should be calculated in accordance with national water pricing policy.

- (c) the financial sustainability of the water services in the geographic area in question;
- (d) the recovery of costs reasonably associated with providing the water services;
- (e) the redemption period of any loans for the provision of water services;
- (f) the need for a return on capital invested for the provision of water services; and
- (g) the need to provide for drought and excess water availability.

(4) No water services institution may use a tariff which is substantially different from any prescribed norms and standards.

A draft set of Norms and Standards were developed in December 1998. Key elements of these Norms and Standards applicable to non-residential water tariff setting are replicated below.

- A WSP must take into account recovery of overhead, operational and maintenance costs, the cost of capital and depreciation when determining its revenue requirements.
- A WSP must differentiate at least between residential, industrial and other (non-residential and non-industrial) consumers.
- Tariffs for water supplied to non-residential users must be based on the volume of water provided and recover at least the capital costs, operating costs and maintenance costs associated with that supply.

1.4 Complementary guidelines

The Water Research Commission's *Management guidelines for water service providers* contains a module on setting water tariffs (Palmer Development Group, 1998d). The module concentrates mainly on water tariffs for residential consumers, explaining this scope as follows:

The focus of the guidelines is on residential tariff structures, reflecting the emphasis of the recent national policy initiatives of DWAF. Little detailed policy and research work has been undertaken in South Africa in recent years on the determination of appropriate tariff structures and levels for non-residential customers. Hence only preliminary comments pertaining to these are made in this guideline. (Palmer Development Group, 1998d: 4-1)

The intention of this guideline, focussing on commercial and industrial tariffs, is to complement the existing guidelines and they should be read in conjunction with these guidelines.

1.5 WSP size and level of tariff reform effort

The size of the WSP, in terms of the number of customers served and the total volume of water sales will influence the approach to setting tariffs. In particular it will influence the feasible level of effort (and hence expenditure) that is warranted and determine the level of detail (and complexity) that is appropriate. Rough approximations of these factors are given in Table 2. These are not prescriptive in any way.

Table 2: WSP size and indicative expenditure of effort on tariff setting

	Small Town	Large Town	Major City
Indicative size categories			
Population in service area	Less than 50 000	Between 50 000 and 1 million	More than 1 million
No. of customers	10 000	10 000 to 200 000	More than 200 000
Indicative annual revenue ¹	Up to R5 million	R5 million to R100 million	More than R100 million
Indicative level of effort			
Indicative expenditure ²	R25 000	R25 000 to R500 000	More than R500 000
Indicative time-frame	Weeks	Months	Continual
Indicative level of detail			
Level of complexity	Formula driven	Moderate adaptation	Advanced adaptation
Level of detail	Engineering estimates	Moderately detailed	Very detailed

Notes:

1. Based on a consumption of 90 lcd and average water tariff of R3/kl
2. Based on 0.5% of annual revenue.

1.6 Learning from international experience

There is much to be learned from the experiences of water tariffing in other countries. A review of the literature on this subject was recently undertaken (Palmer Development Group, 1999g). The lessons from this review are incorporated into these guidelines and specific case studies are presented in Appendix C.

1.7 The tariff reform process

The guidelines set out in this document are based on the following tariff reform process:⁴

1. **Understand the national context.** Develop an understanding of the national policy and institutional context (Section 1.3 and Appendix A).
2. **Understand the local context.** Understand the local institutional, historic, economic and water resources context; understand the market (consumers and water use), the costs of supply, revenues and current tariffs; and undertake a stakeholder analysis (Section 2).
3. **Set tariffing goals, establishing principles and developing performance indicators.** Define and reach consensus on tariffing goals, and in particular, on the

⁴ Adapted from Palmer Development Group (1999g).

prioritisation and weighting of these goals; reach consensus on a basic set of principles; and develop an appropriate set of practical indicators for the measurement of performance against defined targets (Section 3).

4. **Make some preliminary choices.** Understand the different components of the water tariff (development charges, connection charges, fixed fees and volumetric tariffs); decide on the basis for determining tariff levels (revenue requirements, marginal costs); understand the impact of future supply costs and climate on the tariff structure; and examine the scope for cost reductions when determining the revenue requirements (Section 4).
5. **Define the tariff structure and set tariff levels.** Develop the tariff structure and determine the tariff levels with reference to the guidelines presented in Section 5.
6. **Undertake consultation and evaluation exercises.** Evaluate the likely impacts of tariff reform prior to approval and implementation; consult with stakeholders and obtain political approval for tariff reform; and evaluate the impacts of the tariff reform after implementation (Section 6).
7. **Refine tariffs.** Refine the tariff structure and level incrementally so as to better achieve the defined goals and to adhere more closely to the best practice principles.

This structure suggests an iterative approach to tariff reform, whereby annual improvements lead to objectives being achieved over time. The establishment of practical indicators to measure the extent to which specified objectives are being attained will greatly assist with this process of incremental reform.