

WHITE PAPER

FOR THE DEPLOYMENT OF EMERGENCY & DISASTER RELIEF DESALINATION PLANTS

FOR THE CITY OF CAPE TOWN 24 MAY 2017:

ADDITIONAL NOTES

1 WATER TARIFF

1.1 WHAT'S INCLUDED AND WHAT'S NOT?

When comparing water costs and water tariffs it is very important to understand what is included in, and excluded from, the quoted figures. If the constituents making up the quoted figures are not evident or transparent, you may not be comparing apples to apples, but maybe an apple to a fruit salad.

1.2 OPEX VS CAPEX

The second big consideration is if the tariffs include Operational and Maintenance Costs only, or also a Capital Repayment Costs component. If you are planning to increase the water supply by raising a dam wall by two meters or building a desalination plant, it will require substantial capital expenditure. This expenditure is normally recouped by adding the capital cost and the associated financing cost, to the water price over a certain period.

1.3 GRAHAMTEK QUOTED TARIFF

GrahamTek's indicative tariff quoted in the White Paper includes the following:

Opex Component:

- Remote and Site Operations
- Pumping Cost to Distribution Node
- Full Energy Consumption Costs
- Consumables
- Maintenance (Including Components/Consumables)
- Operational Risk Underwriting

Capex Recovery Component:

- Sea Water Intake and Outfall Structures
- Pump Stations and Pumps
- Pre-Treatment of Sea Water
- Reverse Osmosis with Energy and Electricity Recovery
- All associated Civil & Structural Works
- Delivery system for Product Water to agreed Distribution Point

1.4 COST OF GRAHAMTEK DESALINATION WATER VS CURRENT CITY WATER SUPPLY

The City indicated an operational and maintenance cost base for their current water supply through the Western Cape Water Supply System of approximately R4.50/m³. Considering that any augmentation of their surface water supply will also require a large capital investment, we should compare GrahamTek’s estimated OPEX cost of R5.51 to this figure.

The Table below provides a number of scenarios, based on the supply volume contributed by desalination as a percentage of the total supply. In reading the Table, please note the following:

- Desalination should not be seen as a replacement source for current water supply but rather to complement the current supply.
- Desalination is a sustainable drought proof solution that is not weather dependent.
- The idea is to work with the City of Cape Town to find the perfect balance between sustainability and affordability.

No	Kilolitres (Daily)			Desalination Percentage	Costing (Daily)			Cost Difference		
	Dam Water	Desalination	Total Usage		Dam Water @ R4,50	Desalination @ R5,50	Total Usage	Amount	Amount/Kl	Percentage
1	400 000	450 000	850 000	52,94	R 1 800 000,00	R 2 475 000,00	R 4 275 000,00	R 450 000,00	R 0,53	11,76
2	450 000	400 000	850 000	47,06	R 2 025 000,00	R 2 200 000,00	R 4 225 000,00	R 400 000,00	R 0,47	10,46
3	500 000	350 000	850 000	41,18	R 2 250 000,00	R 1 925 000,00	R 4 175 000,00	R 350 000,00	R 0,41	9,15
4	550 000	300 000	850 000	35,29	R 2 475 000,00	R 1 650 000,00	R 4 125 000,00	R 300 000,00	R 0,35	7,84
5	600 000	250 000	850 000	29,41	R 2 700 000,00	R 1 375 000,00	R 4 075 000,00	R 250 000,00	R 0,29	6,54
6	650 000	200 000	850 000	23,53	R 2 925 000,00	R 1 100 000,00	R 4 025 000,00	R 200 000,00	R 0,24	5,23
7	700 000	150 000	850 000	17,65	R 3 150 000,00	R 825 000,00	R 3 975 000,00	R 150 000,00	R 0,18	3,92
8	750 000	100 000	850 000	11,76	R 3 375 000,00	R 550 000,00	R 3 925 000,00	R 100 000,00	R 0,12	2,61
9	800 000	50 000	850 000	5,88	R 3 600 000,00	R 275 000,00	R 3 875 000,00	R 50 000,00	R 0,06	1,31
10	850 000	0	850 000	0,00	R 3 825 000,00	R -	R 3 825 000,00	R -	R -	0,00

As can be seen from the Table, the difference in water price is as little as 6c/kl to a maximum of 53c/kl. A small price to pay for water security. We propose Option 5 with a 30% augmentation of the current water supply with desalinated water as an affordable option that provide a significant increase in the robustness of the City’s water supply.