

Zerfontein Distribution System - Input Variables for Water Requirement Model								
Parameter / Variable	Year	Income Categorization				Com. & Ind. <sup>(D)</sup>	Other <sup>(E)</sup>	Total
		HI	MI	LI	Sub- Total			
Units are presented in brackets with the "Parameter Description" - First Column								
Population <sup>(A)</sup>	2019	885	274	401	1560			
	2024	953	317	627	1898			
	2029	1027	368	914	2309			
	2034	1107	427	1277	2810			
	2039	1192	495	1732	3419			
	2044	1284	573	2302	4159			
Growth (%/year)		Growth in Population				Growth in Demand		
	2019-2024	1.50%	3.00%	9.35%	4.00%	4%	2%	
	2024-2029	1.50%	3.00%	7.83%	4.00%	4%	2%	
	2029-2034	1.50%	3.00%	6.90%	4.00%	4%	2%	
	2034-2039	1.50%	3.00%	6.29%	4.00%	4%	2%	
	2039-2044	1.50%	3.00%	5.85%	4.00%	4%	2%	
Unit Demand (l/c/d) <sup>(B)</sup>	2019	320.0	240.0	120.0	-	-	-	-
Average Annual Daily Water Requirement (KI/d - NRW Excluded)	2019	283	66	48		22	128	547
	2024	305	76	75		27	141	625
	2029	329	88	110		33	156	715
	2034	354	102	153		40	172	822
	2039	381	119	208		48	190	946
	2044	411	138	276		59	210	1093
NRW (%) <sup>(C)</sup>	2019	19.8	19.8	19.8		19.8	19.8	
	2024	15.0	15.0	15.0		15.0	15.0	
	2029	13.8	13.8	13.8		13.8	13.8	
	2034	12.5	12.5	12.5		12.5	12.5	
	2039	11.3	11.3	11.3		11.3	11.3	
	2044	10.0	10.0	10.0		10.0	10.0	
Average Annual Daily Water Requirement (KI/d)	2019	353	82	60		27	160	682
	2024	359	90	89		31	166	735
	2029	381	102	127		38	181	829
	2034	405	117	175		45	197	939
	2039	430	134	234		54	214	1066
	2044	457	153	307		65	233	1215
Average Peak Month Daily Water Requirement (KI/d)	2019	643	149	109		50	290	1242
	2024	653	163	161		57	303	1338
	2029	694	186	232		69	329	1509
	2034	737	213	319		82	358	1709
	2039	782	243	426		99	390	1941
	2044	831	278	559		119	425	2211
Peak Day Water Requirement (KI/d)	2019	803	186	137		62	363	1552
	2024	817	204	201		72	378	1672
	2029	867	233	289		86	412	1887
	2034	921	266	398		103	448	2136
	2039	978	304	533		124	488	2426
	2044	1039	348	698		148	531	2764
Total Annual Water Requirement (KI/year)	2019	128900	29907	21915		10012	58254	248989
	2024	131020	32713	32323		11494	60685	268236
	2029	139100	37374	46429		13781	66031	302715
	2034	147710	42707	63904		16528	71862	342711
	2039	156884	48812	85474		19825	78224	389219
	2044	166662	55801	112014		23785	85166	443427
Peak Month Factor <sup>(F)</sup>		1.82						
Peak Day Factor <sup>(G)</sup>		1.25						

Notes :



TO USE THIS SHEET, FILL IN THE VARIABLES IN THE SHADED BLOCKS ABOVE

References:

- (A) - Projected population for 2019/2020 is based on the Census 2011 data and the estimated future population growth, as agreed with Municipality during January 2014.
- (B) - Residential unit demands estimated.
- (C) - Non Revenue Water (NRW): Calculated NRW from July 2019 to June 2020. Estimated 4.8% reduction in NRW over the next five years.
- (D) - Commercial and Industrial: Calculated from Billed Metered Consumption data for the period July 2016 to June 2017. Average 22 kl/d.
- (E) - Others: Calculated from Billed Metered Consumption data for the period July 2016 to June 2017. Average 33 kl/d.  
Holiday population usage 16/17: Average residential usage for Nov to Febr 729 kl/d - Mar to Oct 440 kl/d, therefore add (289 kl/d x 120) / 365 = 95 kl/d with other users.
- (F) - Peak Month Factor: Maximum value calculated from July 2015 to June 2020 data.
- (G) - Peak Day Factor : Estimated

Yzerfontein Distribution System Projected Water Requirements (Kl/a)							Wastewater Flow		
Year *	Measured Potable Water Requirement (System Input Volume)	Projected Water Requirement from model	Other Projections				Annual Wastewater Flows (Estimated from Billed Metered Consumption Data)		
			2% Annual growth on 2016/2017 Water Requirement	4% Annual growth on 2016/2017 Water Requirement	DWS's Reconciliation Strategy (March 2016)				
						Low	Medium	High	
1995	145 614								
1996	151 025								
1997	132 745								
1998	209 243								
1999	246 470								
2000	223 450								
2001	204 690								
2002	249 211								
2003	260 440							134 796	
2004	204 773							141 493	
2005	203 959							111 851	
2006	251 914							128 926	
2007	275 702							139 162	
2008	301 621							144 631	
2009	303 482							149 144	
2010	320 386							157 624	
2011	316 552							162 095	
2012	313 423							163 765	
2013	312 719							174 673	
2014	367 432							183 487	
2015	317 039							199 918	
2016	248 845					368 000	368 000	368 000	164 281
2017	154 611								129 161
2018	175 903								61 609
2019	238 116	248 989	248 845	248 845					95 956
2024		268 236	274 745	302 758	489 200	509 400	529 800		114 604
2029		302 715	303 341	368 351	573 600	611 800	650 800		
2034		342 711	334 913	448 156	682 200	747 000	817 200		
2039		389 219	369 771	545 250	796 200	889 500	993 700		
2044		443 427	408 257	663 380					

Notes: (\*) The years in the above table refer to the Municipal Financial Years and is for the period July till June the following year. The measured demand for 2019 is therefore from July 2019 up to June 2020.

